SPECIAL ISSUE CONTAINING REPORTS OF THE FIFTH PHILADELPHIA MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES. EDITED BY BURTON E. LIVINGSTON, PERMANENT SECRETARY.

SCIENCE

VOL. LXV JANUARY 28, 1927 No. 1674

CONTENTS

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKeen Cattell and published every Friday by

THE SCIENCE PRESS

Lancaster, Pa. Garrison, N. Y.

New York City: Grand Central Terminal.

Annual Subscription, $6.00. Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary, in the Smithsonian

Entered as second-class matter July 18, 1923, at the Post Office at Lancaster, Pa., under the Act of March 8, 1879.

Annual Subscription, $6.00. Single Copies, 15 Cts.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE PERMANENT SECRETARY'S REPORT ON THE FIFTH PHILADELPHIA MEETING

General Features

Between Monday, December 27, 1926, and Saturday, January 1, 1927, at Philadelphia and mainly in the halls of the University of Pennsylvania occurred the eighty-third meeting of the American Association for the Advancement of Science and Associated Societies. It was the annual meeting for the association year 1926–27. It was the fifth Philadelphia meeting, at which the association returned to the place of its organization; the history of the association begins with the first Philadelphia meeting, of September, 1848.

President L. H. Bailey, eminent plant scientist, author and editor, of Ithaca, New York, presided at this meeting and took active part in many sessions. The retiring president was Dr. Michael I. Pupin, professor of electromechanics in Columbia University, and Dr. Pupin's retiring presidential address was delivered before a crowded audience in Drexel Hall on the opening evening, Monday, December 27. Thoughts and aspirations aroused by this address, on "Fifty Years' Progress in Electrical Communications," will occupy many minds for many hours in the new year just begun. The address has been printed in SCIENCE for December 31, 1926.

Besides the fifteen sections of the American Association, forty-three independent organizations of science workers met with the association at Philadelphia. Most of these are officially *associated* societies, the majority of which are officially *affiliated*. Associated organizations are approved by the council of the association, by which they are admitted to official association. The council has elected many associated organizations to official affiliation with the association, and these have representation in the council and thus take part in directing the affairs of the association. Affiliated organizations each name one council member and those that have on their respective membership lists one hundred or more fellows of the association each name an additional council member. There are now one hundred and twelve associated organiza-

tions, of which eighty-one are affiliated. Of the affiliated organizations, thirty-eight have one and forty-three have two council representatives. In the first group of affiliated organizations are included the twenty-one affiliated state academies of science.

The names of the independent science organizations that met with the association at Philadelphia, together with the names and addresses of their secretaries, are shown in the following list. Names of unassociated organizations are enclosed in brackets and those of affiliated organizations are preceded by either one or two asterisks, the number of asterisks indicating the number of council representatives in each case. The names are arranged according to the association sections with which the organizations are most closely related.

ORGANIZATIONS THAT MET WITH THE ASSOCIATION AT PHILADELPHIA

Related to Section A (Mathematics):

**American Mathematical Society: R. G. D. Richardson, secretary, Brown University, Providence, R. I.

**Mathematical Association of America: W. D. Cairns, secretary, Oberlin College, Oberlin, Ohio.

Related to Section B (Physics):

**American Physical Society: Harold W. Webb, secretary, Columbia University, New York City.

*American Meteorological Society: Charles F. Brooks, secretary, Clark University, Worcester, Mass.

Related to Section D (Astronomy):

**American Astronomical Society: Joel Stebbins, secretary, Washburn Observatory, Madison, Wis.

Related to Section E (Geology and Geography):

**Association of American Geographers: Charles C. Colby, secretary, University of Chicago, Chicago, Ill.

National Council of Geography Teachers: George J. Miller, secretary, State Teachers College, Mankato, Minn.

American Alpine Club: Henry B. DeV. Schwab, secretary, 11 Broadway, New York City.

Related to Section F (Zoological Sciences):

**American Society of Zoologists: Dwight E. Minnich, secretary, University of Minnesota, Minneapolis, Minn.

**Entomological Society of America: J. J. Davis, secretary, Purdue University, Lafayette, Ind.

**American Association of Economic Entomologists: C. W. Collins, secretary, Melrose Highlands, Mass.

*American Society of Parasitologists: W. W. Cort, secretary, 615 N. Wolfe St., Baltimore, Md.

Related to Section G (Botanical Sciences):

**Botanical Society of America: I. F. Lewis, secretary, University, Va.

**American Phytopathological Society: R. J. Haskell, secretary, U. S. Bureau of Plant Industry, Washington, D. C.

*American Society of Plant Physiologists: Scott V. Eaton, secretary, University of Chicago, Chicago, Ill.

Sullivant Moss Society: A. T. Beals, secretary, 2929 Broadway, New York City.

American Fern Society: Charles S. Lewis, secretary, 835 Edgewood Ave., Trenton, N. J.

[Wild Flower Preservation Society: Clara M. Cheatham, secretary, 3740 Oliver St., Washington, D. C.]

Related to Sections F and G:

**American Society of Naturalists: A. F. Shull, secretary, University of Michigan, Ann Arbor, Mich.

**Ecological Society of America: A. O. Weese, secretary, University of Oklahoma, Norman, Okla.

**American Microscopical Society: H. J. Van Cleave, secretary, University of Illinois, Urbana, Ill.

*American Nature-Study Society: E. Laurence Palmer, secretary, Renwick Heights, Ithaca, N. Y.

Phi Sigma Biological Research Society: C. I. Reed, secretary, Baylor University Medical School, Dallas, Tex.

[Joint Genetics Sections of the American Society of Zoologists and the Botanical Society of America: L. C. Dunn, secretary, Connecticut Agricultural Experiment Station, Storrs, Conn.]

[Union of American Biological Societies: B. M. Duggar, secretary, Missouri Botanical Garden, St. Louis, Mo.]

Related to Section H (Anthropology):

**American Anthropological Association: A. V. Kidder, secretary, Phillips Academy, Andover, Mass.

American Folk-Lore Society: Gladys A. Reichard, secretary, Barnard College, New York City.

Related to Section I (Psychology):

**American Psychological Association: Samuel W. Fernberger, secretary, University of Pennsylvania, Philadelphia, Pa.

Related to Section K (Social and Economic Sciences):

Metric Association: Howard Richards, secretary, 156 Fifth Ave., New York City.

Related to Section L (Historical and Philological Sciences):

**History of Science Society: Frederick E. Brasch, secretary, Library of Congress, Washington, D. C.

Related to Section N (Medical Sciences):

**Society of American Bacteriologists: J. M. Sherman, secretary, Cornell University, Ithaca, N. Y.

Related to Section O (Agriculture):

**American Society of Agronomy: P. E. Brown, secretary, Iowa State College, Ames, Iowa.

*American Society for Horticultural Science: C. P. Close, secretary, College Park, Md.

*Society of American Foresters: E. R. Hodson, secretary, Atlantic Building, Washington, D. C.

Potato Association of America: Walter M. Peacock, secretary, Office of Horticultural Investigations, Washington, D. C.

[Crop Protection Institute: Paul Moore, Secretary, National Research Council, Washington, D. C.]

[Geneticists Interested in Agriculture: R. J. Garber,

secretary, West Virginia University, Morgantown, W. Va.]

Related to Section Q (Education):

Phi Delta Kappa Fraternity: Clayton R. Wise, secretary, 10403 St. Clair St., Cleveland, Ohio.

Related to the Association as a Whole:

**Society of Sigma Xi: Edward Ellery, secretary, Union College, Schenectady, N. Y.

**American Association of University Professors: H. W. Tyler, secretary, Massachusetts Institute of Technology, Cambridge, Mass.

Gamma Alpha Graduate Scientific Fraternity: C. W. Dodge, secretary, 20 Divinity Ave., Cambridge, Mass.

[Sigma Delta Epsilon Graduate Women's Scientific Fraternity: Julia T. Colpitts, secretary, Ames, Iowa.]

[Pi Mu Epsilon Mathematical Fraternity: E. D. Roe, Jr., director general, 123 W. Ostrander Ave., Syracuse, N. Y.]

ATTENDANCE

The success of one of these great annual conventions is in some degree indicated by the attendance. Three thousand one hundred and eighty-one were registered at Philadelphia. With the single exception of the fifth Washington meeting, two years ago, this is the largest registration in the history of the association. The registration records for the last seven annual meetings are as follows:

Third Chicago Meeting (Dec., 1920), 2,413.
Second Toronto Meeting (Dec., 1921), 1,832.
Fourth Boston Meeting (Dec., 1922), 2,339.
Third Cincinnati Meeting (Dec., 1923), 2,211.
Fifth Washington Meeting (Dec., 1924), 4,206.
Kansas City Meeting (Dec., 1925), 1,931.
Fifth Philadelphia Meeting (Dec., 1926), 3,181.

It is certain that the number of persons actually in attendance was, in each case, considerably larger than is indicated by the registration record, for many local people and some from away failed to register. But these registration figures are probably accurately indicative.

The residence distribution of those who registered at Philadelphia is shown below.

Registration at Philadelphia, by States and Provinces

Alabama	4
Arizona	4
Arkansas	3
California	31
Colorado	17
Connecticut	116
Delaware	25
District of Columbia	226
Florida	18
Georgia	16
Illinois	133
Indiana	45
Iowa	40
Kansas	23
Kentucky	16
Louisiana	16
Maine	30
Manitoba	1
Maryland	118
Massachusetts	194
Michigan	69
Minnesota	45
Mississippi	7
Missouri	40
Montana	6
Nebraska	14
New Hampshire	26
New Jersey	147
New Mexico	2
New York	665
North Carolina	30
North Dakota	9
Ohio	162
Oklahoma	6
Ontario	36
Oregon	5
Philadelphia	202
Pennsylvania (outside of Philadelphia)	316
Quebec	14
Rhode Island	41
South Carolina	15
South Dakota	2
Tennessee	19
Texas	13
Utah	2
Vermont	11
Virginia	72
Washington	2
West Virginia	30
Wisconsin	58
Wyoming	1
Miscellaneous, outside of United States and Canada	38
Total	3,181

SESSIONS AND PAPERS

Altogether there were 222 scientific sessions held at the Philadelphia meeting. Omitting about forty papers that were presented by title only, 1,449 papers and addresses were delivered at Philadelphia. It is interesting to compare these data with those of earlier meetings, as shown on next page.

It is clear that the fifth Philadelphia meeting ranks next to the fifth Washington meeting in sessions and in the number of papers presented, as well as in registered attendance.

MEETING PLACES AND FACILITIES

The Philadelphia sessions were held mainly in the rooms of the University of Pennsylvania, use being

Meeting	Registration	Membership on Dec. 31	No. of sessions	No. of papers	Sessions each day
Third Chicago (Dec., 1920)	2,413	——	184	——	Mon. Tu. Wed. Th. Fri. Sat. 9 53 59 53 8 2
Second Toronto (Dec., 1921)	1,832	11,414	123	——	Tu. Wed. Th. Fri. Sat. 13 34 44 30 2
Fourth Boston (Dec., 1922)	2,339	11,537	159	1,019	Tu. Wed. Th. Fri. Sat. 2 45 54 52 6
Third Cincinnati (Dec., 1923)	2,211	12,015	190	1,140	Wed. Th. Fri. Sat. Sun. Mon. Tu. Wed. 2 29 62 56 4 22 11 4
Fifth Washington (Dec., 1924)	4,206	13,695	252	1,781	Mon. Tu. Wed. Th. Fri. Sat. 49 71 69 42 16 5
Kansas City (Dec., 1925)	1,931	14,316	117	985	Mon. Tu. Wed. Th. Fri. Sat. 14 35 34 25 7 2
Fifth Philadelphia (Dec., 1926)	3,181	14,430	222	1,449	Mon. Tu. Wed. Th. Fri. Sat. 22 62 71 54 11 2

made of the following buildings of the university: College Hall, Bennett Hall, Harrison Laboratory of Chemistry, Hare Laboratory of Chemistry, Engineering Building, Logan Hall, Medical Laboratory, Zoological Laboratory, Veterinary Laboratory, Pearson Hall, Weightman Hall, McFarlane Hall, Houston Hall, Morgan Laboratory of Physics, Laboratory of Hygiene.

The auditoriums of the Drexel Institute, the Franklin Institute, the Academy of Natural Science, the Girls' Trade School and the Church of the Transfiguration were also used, as well as rooms in the Bellevue-Stratford Hotel, the Benjamin Franklin Hotel, the Hotel Walton, the Rittenhouse Hotel, the Hotel Pennsylvania, the Hotel Normandie and the Hotel Bartram.

The general hotel headquarters were at the Bellevue-Stratford Hotel, which very generously placed a number of complimentary rooms at the disposal of the association. A number of other hotels were headquarters for societies and supplied session rooms in some cases. To the management of the Bellevue-Stratford and other hotels the association is very thankful.

The registration offices, in charge of Mr. Sam Woodley, executive assistant, the news offices, in charge of Mr. Austin H. Clark, news manager, and the general science exhibition, in charge of Major H. S. Kimberly, exhibition manager, were in Weightman Hall, the university gymnasium, where the arrangements were ample and exceptionally satisfactory for these purposes.

Most of the lanterns used at the numerous sessions were very kindly loaned by the Bausch and Lomb Optical Co., of Rochester, N. Y., and the association expresses its cordial thanks for this great and tangible help.

The cash registers used in the registration office were loaned to the association through the courtesy of the National Cash Register Company. The use of these machines was a new feature in the registration procedure and resulted in greatly aiding the accounting work of the registration office. The association expresses its appreciative thanks to the National Cash Register Company, through Mr. John P. Watson, manager of the Philadelphia office.

The cordial thanks of the association and of all who attended the great Philadelphia meeting are due and are here expressed to the authorities of the University of Pennsylvania, without whose cooperation and generosity the meeting could not have been held. The

Drexel Institute, the Franklin Institute, the Academy of Natural Sciences, the American Philosophical Society and the Philadelphia School Board were also very helpful in caring for the meeting and their help is heartily and gratefully acknowledged. To the members of the local committee and their coworkers are here expressed the cordial thanks of the association and the associated societies that joined with it in the fifth Philadelphia meeting. Many thanks are also due to the representatives of the local press and of more distant newspapers and to the representatives of the many news agencies; many of these people worked indefatigably to present the work of the meeting to the public at large and throughout the country.

LOCAL COMMITTEES FOR THE FIFTH PHILADELPHIA MEETING

Local Committee on Arrangements

C. E. McClung, *chairman*, professor of zoology and director of the laboratory, University of Pennsylvania.
Samuel W. Fernberger, *secretary*, assistant professor of psychology, University of Pennsylvania.
W. H. DuBarry, assistant to the president, University of Pennsylvania.
G. H. Hallett, professor of mathematics, University of Pennsylvania.
G. E. Nitzsche, recorder, University of Pennsylvania.
Reese James, professor of English, University of Pennsylvania.
W. T. Taggart, professor of chemistry, University of Pennsylvania.
Thomas Hart, director of Houston Hall, University of Pennsylvania.
Arthur W. Goodspeed (representing the American Philosophical Society), professor of physics and director of the laboratory, University of Pennsylvania.
T. Chalkley Palmer (representing the Academy of Natural Sciences), director of the Academy of Natural Sciences.
Howard McClenahan (representing the Franklin Institute), secretary of the Franklin Institute.
George Wheeler (representing the Philadelphia Public Schools), assistant superintendent, Philadelphia Public Schools.

Chairmen of Subcommittees

Finance: W. H. DuBarry.
Meeting Places: G. H. Hallett.
Hotels and Housing: G. E. Nitzsche.
Publicity: Reese James.
Exhibition: W. T. Taggart.
Transportation: Thomas Hart.
Entertainment: G. E. Nitzsche.

Local Representatives for Sections of the Association

Section A (Mathematics): George C. Chambers.
Section B (Physics): Arthur W. Goodspeed.
Section C (Chemistry): Walter T. Taggart.
Section D (Astronomy): Samuel G. Barton.
Section E (Geology and Geography): Frederick Ehrenfeld.
Section F (Zoological Sciences): D. H. Wenrich.
Section G (Botanical Sciences): Rodney H. True.
Section H (Anthropology): Frank G. Speck.
Section I (Psychology): Edwin B. Twitmyer.
Section K (Social and Economic Sciences): James P. Lichtenberger.
Section L (Historical and Philological Sciences): Arthur C. Howland.
Section M (Engineering): Robert H. Fernald.
Section N (Medical Sciences): Wm. Pepper.
Section O (Agriculture): John W. Harshberger.
Section Q (Education): James C. Miller.
Societies not specially related to any single section: Samuel W. Fernberger.

OFFICIAL REPRESENTATION AT THE PHILADELPHIA MEETING

Cards of invitation were sent out, as usual, asking research institutions and laboratories and scientific organizations to name representatives for the meeting. Following is the record of the names of those who did so:

British Association for the Advancement of Science; New Zealand Institute; University of California; Stanford University; University of Denver; Trinity College; Wesleyan University; University of Delaware; U. S. Department of Agriculture; Carnegie Institution of Washington; Georgetown University; Smithsonian Institution; War Department; Georgia School of Technology; John Crerar Library; Northwestern University; Iowa State College; University of Kentucky; Tulane University, of Louisiana; Colby College; University of Maine; Goucher College; Boston University; Clark University; Harvard University; Massachusetts Agricultural College; Mount Holyoke College; Radcliffe College; Tufts College; Wellesley College; Worcester Polytechnic Institute; University of Michigan; Michigan State College; State University of Montana; New Jersey Agricultural Experiment Station; Rutgers University; Brooklyn Botanic Garden; Cooper Union; Eastman Kodak Company; Fordham University; General Electric Company; Hamilton College; Hunter College of the City of New York; New York Botanical Garden; New York Zoological Society; Rensselaer Polytechnic Institute; University of Rochester; Rockefeller Institute for Medical Research; Syracuse University; North Dakota Agricultural College; Case School of Applied Science; University of Cincinnati; National Lamp Works of General Electric Company; Ohio Wesleyan University; University of Toledo; Wittenberg College; Academy of Natural Sciences of Philadelphia; Carnegie Museum; Drexel Institute; Lafayette College; Lehigh University; Mellon Institute of Industrial Research; Haverford College; Pennsylvania Railroad System; University of Pittsburgh; Philadelphia College of Pharmacy and Science; Swarthmore College; Temple University; Rice Institute; University of Texas; University of Virginia; West Virginia University; Lawrence College; University of Wisconsin.

Many other organizations and institutions were unofficially represented at the meeting.

THE PRELIMINARY ANNOUNCEMENTS AND THE GENERAL PROGRAM

Following the new plan introduced last year, the preliminary announcement of the fifth Philadelphia meeting was published in SCIENCE. It occupied eighteen pages of the special issue of December 3. A copy of the special issue was sent to every subscriber to *The Scientific Monthly*, as well as to every name on the subscription list of SCIENCE itself. In this way the announcement was promptly placed in the hands of all members in a very convenient form, and at a very low cost to the association.

Most of the material for the general program was in hand by December 15 and the actual work of printing the book was accomplished after that date. Considerable additions and alterations had to be cared for while the book was in press. The program editor, Dr. Sam F. Trelease, and Mrs. Trelease who ably assisted him in the editing and publishing of the general program, went to Philadelphia ten days before the opening of the meeting and remained there, working day and night, till the book was finished. It was available for the secretaries conference Sunday evening, December 26, and was supplied to all who registered, beginning Monday morning. Sunday, Monday and Monday night were devoted by Dr. and Mrs. Trelease, with the additional assistance of Mr. Wm. E. L. Drake, to the preparation and publication of a supplement to the program, which was available Tuesday morning. The work of the program editor is greatly appreciated by the association. This work is perhaps the most exacting of all the exacting details that require attention just before the opening of the annual meeting. The association is grateful to the Botanical Department of Columbia University, which made it possible for Dr. Trelease to give much time to editing and publishing the program during more than a month just preceding the meeting. The efficient cooperation and the helpful attitude of the many section and society secretaries, who furnished the special programs to the Washington office with generally unusual promptness this year, is greatly appreciated by the permanent secretary and the program editor.

The general program is a book of 245 pages, 14.5 cm high and 21.5 cm wide, containing the usual material of this publication. The paper stock is somewhat thinner than has been used for the purpose in recent years and the book is less than a centimeter thick. The cover is white, crossed at the upper left corner by bands of red and blue, the colors of the University of Pennsylvania.

Thirteen pages of selected advertising are included in the general program this year, the income from which helps to pay the cost of printing the book. The association appreciates the help given in this way by the advertisers and bespeaks a careful reading of the advertising pages by the members.

The unusually difficult work of printing the book was performed by the John C. Winston Company, of Philadelphia. The permanent secretary, the program editor and the local committee on arrangements are deeply appreciative of the excellent service given by the Winston Company, and especially for the personal interest and unlimited cooperation of Mr. Charles H. Clarke, of that company.

The supplement to the program contains eight pages, presenting a summary of the science exhibitions, including the several society exhibitions, and a very few slight corrections and additions for the general program.

Copies of the Philadelphia general program and the supplement may be had on request, from the permanent secretary's office, in the Smithsonian Institution Building, Washington, D. C.

FINANCIAL ARRANGEMENTS FOR THE PHILADELPHIA MEETING

There must be special arrangements for securing funds to care for the extra expense of each annual meeting, and the undertaking of the preliminary work for one of these large conventions is now a very considerable financial affair. Only a small portion of the extra cost of such a meeting as the one just ended can be cared for from the regular current funds of the association. There are four general sources from which this extra cost may be met: (1) The current funds of the association; (2) funds raised by extra contributions from those attending the meeting, in the form of certificate validation or registration fees; (3) funds realized from profit-making aspects of the meeting itself, as from advertisements in the general program; and (4) funds raised by contributions from institutions and organizations of the city in which the meeting is held.

The fourth of these sources is always the most important, and the association and the associated societies that meet with it are the recipients of very much local financial support. In the case of the fifth Philadelphia meeting this support was in the form of a large contribution secured by the local finance committee from the University of Pennsylvania, which very generously contributed not only the use of its wonderfully suitable halls and rooms and general facilities, but also gave a large fund of money. To the university authorities and especially to Mr. W. H. DuBarry, chairman of the local finance committee, who personally gave very generously of his knowledge and experience and time and energy, the association and all who enjoyed the fine Philadelphia arrangements are deeply and very gratefully indebted.

The association has been reluctant to increase in any way the expense incurred by those who attend the annual meetings, for these people generally find attendance very expensive, especially when they have to travel far. But some sort of small individual tax has seemed necessary in recent years. A fifty-cent certificate-validation fee was collected from those who used railway certificates at the recent Washington and Kansas City meetings. Such an individual contribution from those who attend from a distance seemed to be fair because the association secures the reduced railway rates and cares for the very troublesome and exacting task of looking after the thousands of certificate-validations that are required—a responsibility that consumes a great deal of the very valuable time and energy of the executive assistant, Mr. Sam Woodley, during the rather hectic period of the meeting.

Many attend the annual meetings, however, and receive the advantages there provided, without being members of the association, while another large part of the attendance is by regular members of the association. The latter have contributed toward the support of the association by the payment of the regular dues. Many non-members who attend the meetings are members of associated societies, to which they pay dues, but this is true of most of the association members also. On account of these considerations a regular registration fee of one dollar was inaugurated at the Philadelphia meeting instead of the validation fee, but provision was made by which the registration fee might be remitted to all members of the association. That is, it was not required that the fee be paid by those who had already contributed to the support of the association for the current year. It should be remembered that membership in an associated organization involves no financial contribution to the association itself, for the associated organizations make no contributions in any form to the funds of the association. If there are any who misunderstood the implication of the registration-fee arrangement at Philadelphia, with its apparent partiality to regular members of the association, such misunderstanding may have arisen from an erroneous feeling, occasionally encountered, that membership in an associated society constituted actual membership in the larger organization. The association cooperates closely with the associated organizations, receiving and giving support of many kinds, but each organization is quite independent financially. The affiliated state academies of science, which have a special form of affiliation and receive small funds annually from the current funds of the association, constitute an exception to the last clause.

The income from registration fees paid at Philadelphia amounted to $1,303.00, and $10.50 was received for extra copies of the general program, while the income from advertising in the program was $425.00.

An approximate statement of the expenses incurred because of the Philadelphia meeting follows. An accurate statement can not be made as yet. It is interesting to note that the extra cost of the meeting was on the average about $2.75 per person registered as in attendance.

Preliminary announcement (extra printing and distribution)	$ 600.00
General program and supplement (preparation)	538.50
General program and supplement (printing)	2,085.00
News Service	170.00
Travel (preliminary trips, Washington to Philadelphia)	51.90
Printing (cards, notices, etc.)	244.77
Signs, electrical equipment, etc.	759.75
Popular lectures	305.10
Reception	1,270.15
Clerical assistance and supplies (for registration)	941.75
Miscellaneous items	612.04
Final reports of meeting (extra printing and distribution)	1,200.00
Total	$8,778.96

THE SCIENCE EXHIBITION

The Committee on Exhibition, the chairman of which is H. E. Howe, editor of the *Journal of Industrial and Engineering Chemistry,* with the very helpful and valuable cooperation of Professor W. T. Taggart, of the University of Pennsylvania, chairman of the local subcommittee on exhibits, made great advances this year. The Philadelphia exhibition was the largest and most satisfactory display of this sort that has ever been held in connection with an annual meeting. The details were largely due to the work of Major H. S. Kimberly, manager of the general exhibition, and to the fine cooperation of the numerous exhibiting firms, as well as to the aid of Professor Taggart. The large hall of the gymnasium of the University of Pennsylvania, Weightman Hall, was well filled with exhibits, very conveniently and attractively arranged. In the midst of this hall, around a large, well-decorated Christmas tree, were the registration desks for the meeting. The general exhibition was the main social center of the convention. Tea was served here every afternoon and there were several attractive evening entertainments. The expense of the general exhibition was borne wholly by the commercial exhibitors, who paid at a regular rate for their booths. These exhibitors expressed themselves as well pleased with the arrangements.

It is planned that the Nashville exhibition, next year, will be held in one of the large hotels, where

surroundings will be more attractive than is possible in a gymnasium. Members of the association and of the associated societies are asked to keep the Nashville science exhibition in mind throughout the year, exerting their influence, whenever possible, to secure an even larger number of commercial firms as exhibitors.

The following is a list of the firms and organizations that occupied booths at Philadelphia.

The American Association for Medical Progress: Charts and literature showing the value of research in medical science.

The American Home Economics Association: The Journal of Home Economics and other literature.

The American Medical Association: Journal and literature.

The American Public Health Association: Literature.

The Bausch and Lomb Optical Co.: Microscopes and accessories, projection apparatus, photomicrographic cameras, refractometers, spectrometers, colorimeters, centrifuges, field glasses and other optical products. The Bausch and Lomb Optical Company again this year loaned most of the lanterns and daylight screens used at the meeting.

P. Blakiston's Son and Co.: Medical and science books.

The Chemical Foundation: Literature.

The Christian Science Monitor Committee of Philadelphia: The *Christian Science Monitor,* an international daily newspaper which reports much scientific work unusually well.

The Coleman and Bell Co.: Laboratory reagents, stains, etc.

The Commission on Standardization of Biological Stains: Stains and literature.

The Denoyer-Geppert Co.: Classroom teaching-helps, charts, models, preparations, especially for biology.

Dow Chemical Co.: Dow metal.

The Eastman Kodak Co.: Organic chemicals, sensitizers, light filters, special cameras and projectors.

Fiala Outfits, Inc.: Altimeters, tabloid medicine kits, photographic reagents.

General Biological Supply House: Models and specimens for the teaching biologist.

The Kewaunee Manufacturing Co.: Laboratory furniture and fixtures.

The Kny-Scheerer Corporation of America: Laboratory apparatus, preparations, supplies.

The Leeds and Northrup Co.: Precision apparatus for H-ion determination, for conductivity, temperature, etc., recorders for humidity, light temperature.

E. Leitz, Inc.: Microscopes, projectors, special photographic apparatus, range fingers, museum jars, etc.

The Mallinckrodt Chemical Works: Chemicals, etc.

The Matheson Co.: Compressed gases.

The Spencer Lens Co.: Microscopes and other optical instruments, a new microtome, etc.

The Arthur H. Thomas Co.: Apparatus for the chemical and biological laboratory, of many kinds.

The Union Switch and Signal Co.: The Junction Rectifier, by L. O. Grondahl.

The D. Van Nostrand Co.: Science text and reference books.

The Victor Talking Machine Co.: Apparatus for reproduction of total musical range.

The Weston Electric Instrument Corporation: Precision electric instruments of many kinds.

The World Book Co.: Intelligence and achievement tests from kindergarten to college, science books, etc.

Besides the commercial exhibits, there were a number of attractive and instructive exhibits by individuals and institutions, including exhibits by the U. S. Bureau of Standards, the U. S. Bureau of Fisheries, the Biological and Microanalytical Laboratories of the Philadelphia College of Pharmacy and Science, the Laboratory of Plant Physiology of the Johns Hopkins University, Mr. C. Francis Jenkins, and others. All these showed the results of scientific research.

Members who learn of scientific results or research methods that can be shown advantageously in an exhibit are asked to bear this feature of the annual meeting in mind and make suggestions to the permanent secretary at any time. The committee wishes to invite such exhibitors to take part, and a portion of the Nashville exhibition is to be set aside for invitation exhibits of a special scientific nature. The annual science exhibition is now on its feet as a vigorously going affair of the annual meeting, but we need more exhibits of a non-commercial nature than we have succeeded in securing in recent years.

A number of societies held special exhibitions in rooms near their meeting places, but it has not been possible to secure satisfactory lists of these society exhibitions. Great gain to all concerned will be achieved if those in charge of society exhibitions will, in future years, prepare good catalogues of their exhibits and have such lists in the hands of the program editor at the opening of the meeting.

THE FOURTH AWARD OF THE AMERICAN ASSOCIATION PRIZE

For the fourth time, the annual prize of the American Association for the Advancement of Science was awarded at the fifth Philadelphia meeting. These thousand-dollar prizes are awarded from a fund given to the association by one of its members, who wishes his name withheld. Funds are available for two more annual prizes, after the one just awarded. According to the terms of the gift and rules adopted by the association council, the prize is to be awarded to some person presenting at the annual meeting a notable contribution to the advancement of science. All papers presented on the programs of the Philadelphia meeting were eligible for consideration, whether or not their authors were members of the association. The secretary of each section and society that met at Philadelphia was asked to consult others and submit

titles of papers presented in the sessions of his organization, for consideration in the making of the award. These nominations were thoroughly investigated and considered by the Committee on the Award of the Philadelphia Prize, and the name of the winner was announced Saturday at the close of the meeting.

The Committee on Award was composed of the following members:

C. E. Seashore, *chairman*, University of Iowa.
Otis W. Caldwell, Lincoln School, Columbia University.
C. B. Davenport, Station for Experimental Evolution, Cold Spring Harbor, Long Island, New York.
Lauder W. Jones, Princeton University.
C. F. Marbut, Bureau of Soils, U. S. Department of Agriculture.

To the chairman and other members of this committee are here expressed the cordial and appreciative thanks of the association. The importance of the American Association Prize is very great to American science and to the association and the task of deciding on the award is difficult and delicate.

The Philadelphia prize was awarded to Dr. George D. Birkhoff, professor of mathematics in Harvard University. The paper for which the prize was awarded was Dr. Birkhoff's address as retiring president of the American Mathematical Society, on "A Mathematical Critique of Some Physical Theories."

Earlier winners of the American Association Prize are as follows:

(1) The Cincinnati award, January, 1924. L. E. Dickson, for contributions to the theory of numbers.
(2) The Washington award, January, 1925. Divided equally between Dr. Edwin P. Hubble, for contributions on spiral nebulae, and Dr. L. R. Cleveland, for contributions on the physiology of termites and their intestinal protozoa.
(3) The Kansas City award, January, 1926. Dr. Dayton C. Miller, for contributions on the ether-drift experiment.

Special attention should be called to these prizes and to the purpose for which they are awarded; that is, to stimulate interest in high-class contributions at the annual meetings and to encourage the presentation of the best American scientific work on these occasions. The more noteworthy advances made during the year in every field of knowledge should always be presented at the annual meeting. It is the hope of the donor of the American Association Prize that it may serve each year as a concrete and tangible aid to some American science worker, enabling him to go farther along his chosen line.

LUNCHEONS, DINNERS, ETC.

The numerous luncheons, dinners, etc., of the Philadelphia meeting were well attended and were successful in every way. A list of these follows:

Monday noon, December 27:
Luncheon of the Metric Association.

Monday evening, December 27:
Dinner of the American Nature-Study Society.
Smoker for all biologists.
Dinner of the Metric Association.

Tuesday evening, December 28:
Dinner of the National Council of Geography Teachers.
Dinner for all zoologists.
Bio-Medical Mixer and Dance.
Smoker for all entomologists.
Smoker of the Society of American Bacteriologists.
Dinner of the Crop Protection Institute.
Joint dinner of Section Q and the Phi Delta Kappa Fraternity.
Dinner of the Society of Sigma Xi.
Dinner of the Gamma Alpha Graduate Scientific Fraternity.

Wednesday morning, December 29:
Breakfast of the Sigma Delta Epsilon Graduate Women's Scientific Fraternity.

Wednesday noon, December 29:
Luncheon of the American Society of Parasitologists.

Wednesday evening, December 29:
Joint dinner of Section A, the American Mathematical Society and the Mathematical Association of America.
Dinner of the American Physical Society.
Dinner of the American Astronomical Society.
Joint dinner of Section E and the Association of American Geographers.
Dinner of the American Phytopathological Society.
Dinner of the American Society of Plant Physiologists.
Dinner of the American Society of Naturalists.
Dinner of Section H, the American Anthropological Association, and the American Folk-Lore Society.
Dinner of the American Psychological Association.
Dinner of Section M.
Dinner of the Society of American Bacteriologists.

Thursday morning, December 30:
Breakfast of the Sigma Delta Epsilon Graduate Women's Scientific Fraternity.

Thursday noon, December 30:
Luncheon of the Council of the American Meteorological Society.

Thursday evening, December 30:
Dinner for all entomologists.
Dinner for all botanists.
Smoker for all ecologists and their friends.
Dinner of Section O and all associated societies.
Dinner of the American Society for Horticultural Science.

Friday evening, December 31:
Dinner of the American Association of University Professors.

NEWS SERVICE AT PHILADELPHIA

(Report by Austin H. Clark, News Manager)

The outstanding feature of the Philadelphia meeting, in its relation to the general public, was the exceptionally high quality of all the representatives of the press. For the first time in its history the association was regarded by all the local papers, as well as by all the general news services, as worthy of the best efforts of really first-class men.

For some years past the officers of the association have been making a sincere effort to provide the press with a complete account of its activities for inspection and interpretation to the general public. During the same period the press has shown itself more and more appreciative of the work of the association, and at last complete understanding of each by the other has been reached.

One of the important functions of the association at its annual meetings is the general dissemination of scientific information through cooperation with the representatives of the press. Through this cooperation with the press the public is informed of the latest application of discoveries in science; is interested anew by the recital of recently discovered facts, and is enabled to follow the various and diverse efforts which are being made to correlate groups of disconnected facts and thus to make them into a useful whole.

In order most effectively to carry out this part of the work of the association, there has been established in connection with the annual meetings a clearing house for scientific news, the object of which is to make readily available for the representatives of the press the subject matter of the talks delivered and also information relative to the activities of the association. In other words, this news service aims to assist the press in interpreting the activities of the associato the world at large.

Every one who was to read a paper at this meeting was asked, by means of a special letter from the permanent secretary, to supply the news service with copies of the manuscript and also an abstract, for submission to the press in advance of the reading of the paper. If the representatives of the press have this material well in advance they are able to go over it at leisure and to make inquiries in regard to points that may not be quite clear to them, thus being able to make better and more extended presentations.

Adequate publicity for the fifth Philadelphia meeting would not have been possible had it not been for the able assistance rendered by Mr. Henry Herbert, head of the publicity bureau of the University of Pennsylvania. Called upon to act only a few days before the meetings began and wholly unfamiliar with the enormous scope and volume of the material to be handled, Mr. Herbert showed himself to be able easily to master a most difficult situation. A large amount of material had been sent to Philadelphia a week in advance of the opening of the sessions, for advance study by the press representatives. When Mr. Herbert was asked to take charge of the local work this material could not be found, and it was not located until the actual opening of the meetings on Monday morning. Over two hundred of the abstracts sent to Philadelphia were not yet dated, and it was necessary to supply the dates from the printed program before they could be made available for use. There were also many other things to be done, while during the entire day the news office was under very heavy pressure from outside. By midnight on Monday night practically all the material had been dated, other necessary details had been attended to and everything was in smoothly-running order.

As in previous years, though at this meeting to a greater extent than formerly, the association enjoyed and profited by the cooperation of Science Service. Mr. Watson Davis and Mr. James Stokley, of Science Service, who were in constant touch with the news manager not only during the sessions, but also for the three weeks preceding, and rendered every possible assistance. The association greatly appreciates this help.

The total number of abstracts and papers received was 622. As these came in they were divided into six classes which were designated by the letters M, A, B, C, D and X.

Abstracts marked M were those that included material of general interest, written in good popular style and of a length not exceeding two mimeographed pages. These were mimeographed, fifty copies of each being run off. When they were accompanied by a complete paper the fact was noted on the mimeographed sheet and the additional manuscript was made available for study at the news office. The heading of the mimeographed sheets had the following form:

Release: Friday, December 31; evening papers.
Note: Additional information available at the News Office.
Title: Building codes modified by white-ants or termites.
Author: Dr. Thomas E. Snyder, Bureau of Entomology, U. S. Department of Agriculture.

The text of the mimeographed sheets was double-spaced, to allow the insertion of explanatory or other pencil notes.

Abstracts or papers marked A were those that included material of general interest written in such a manner as to be intelligible to any one with a good education. Many abstracts or papers marked A

would have been mimeographed had they not been too long. Short abstracts marked A were for the most part those which, though excellently prepared, were somewhat limited in their popular appeal, or of more or less local application.

The dividing line between the mimeographed abstracts and those marked A is of course a more or less arbitrary one. The number of mimeographed papers available at a meeting of this sort should be about ten for each day, or between 50 and 60 in all. If there are more than this there is always the possibility that too much reliance will be placed on the mimeographed sheets and the incentive for examination of the other material by the representatives of the press may be decreased.

The letter B was used to indicate material of less, though still considerable, popular interest. The letter C indicated material which, though easily intelligible, was of little general interest. The letter D was used for abstracts and papers including technical terms not generally understood.

Abstracts marked X were those which were judged not to be suitable for press notice, either because they included symbols which can not be set in newspaper type, or because of the nature of the subject-matter. However, these were laid out with the others, for examination by the representatives of the press. These men know public sentiment in regard to the various different lines of science, and experience has shown that they can be relied upon never to publish anything that might prejudice the association or science in general in the public mind.

This classification of the abstracts and papers for the news service, it should be remembered, has nothing to do with the intrinsic value of the subject-matter. It concerns merely the relative value of the papers from the standpoint of immediate newspaper availability.

At the Washington meeting all the material was made available for examination by the press as soon as it was received. This enabled the reporters to go over it at leisure and to make up fairly complete stories for each day of the meetings before the meetings actually began. With this preliminary work done, they were able to spend their time in seeking interviews and in developing various leads which they had discovered from a study of the abstracts. Also in many cases accounts of the meetings were mailed in advance to distant papers, which were later supplemented by telegraphic additions.

At Philadelphia the mimeographed sheets were assembled in fifty complete sets which were distributed on Monday morning. There were four release times for each day, morning (for papers read the preceding evening), noon, afternoon and evening. The release date marked on a paper or abstract was final, and was not changed if the reading of the paper happened to be advanced or postponed. The reason for this is that many of the reports were sent in long in advance and it was not possible to follow these up. If such changes were attempted it might easily happen that one paper in a city would print a story two or three days in advance of the date of release for the same story in the office of another paper. For the same reason authors can not make changes in their papers after they have been made available for examination by the press representatives. All the newspapers are entitled to the same treatment, and it would be obviously unfair to insert a correction, no matter how trivial, in a paper after the story had been sent out by one or more of the reporters present.

The 622 abstracts and papers received in connection with the Philadelphia meeting were classified as follows: M, 51;[1] A, 28; B, 71; C, 196; D, 236; X, 40.

Through the courtesy of Radio Station WOO (Wanamaker's) and Station WIP (Gimbel Brothers) and the cordial cooperation of Science Service, represented by Mr. James Stokley, a series of five radio talks was arranged, one for each day from Monday to Friday inclusive. These radio talks were as follows:

Monday evening, December 27th, Station WOO.—"What Science means to Humanity." Dr. Vernon Kellogg, secretary of the National Research Council, Washington, D. C. (read, in the absence of Dr. Kellogg, by Mr. James Stokley).

Tuesday evening, December 28th, Station WIP.—"Artificial Lighting and Civilization." Dr. M. Luckiesh, director of the Nela Laboratories, Cleveland, Ohio.

Wednesday evening, December 29th, Station WOO.—Address by Dr. Michael Pupin, the retiring president of the American Association.

Thursday evening, December 30th, Station WIP.—"Why Plants need Water." Dr. Burton E. Livingston, director of the Laboratory of Plant Physiology, Johns Hopkins University, Baltimore; permanent secretary of the association.

Friday evening, December 31st, Station WOO.—Science News from the Association Meetings. Dr. Edwin E. Slosson, director of Science Service, Washington, D. C.

THE GENERAL AND COMPLIMENTARY PROGRAMS AT PHILADELPHIA

There were nine general sessions of the association at Philadelphia, and four evening lectures especially for the high-school students of the city. The presentation of non-technical lectures in connection with the annual meetings is being more strongly empha-

[1] Of these twenty were accompanied by complete papers.

sized as an important part of the work of the association and plans are being made to improve this feature still further in future years.

At the opening session, on Monday evening, December 27, the convention was opened by Dr. C. E. McClung, chairman of the local committee on arrangements, who, as he said, introduced the introducers. Dr. Josiah H. Penniman, provost of the University of Pennsylvania, graciously welcomed the association and associated societies to Philadelphia and Dr. Penniman's cordial remarks were responded to by the president of the association, Dr. L. H. Bailey, who expressed the great pleasure of American men and women of science in coming together again in Philadelphia. The main address of the session was that of the retiring president of the association, Dr. Michael I. Pupin, who spoke on "Fifty Years' Progress in Electrical Communications." This address has appeared in full in SCIENCE for December 31, 1926.

At the close of the opening session the large audience went to the Franklin Field-Palestra, the new indoor stadium of the University of Pennsylvania, for the annual general reception, when music and refreshments were generously provided. The Field-Palestra was used for the first time on this occasion.

Two general sessions were held on Tuesday afternoon. One was devoted to the Fourth Annual Josiah Willard Gibbs Lecture, of the American Mathematical Society, the lecturer being H. B. Williams. Dr. Williams spoke on "Mathematics and the Biological Sciences." The other general session was devoted to a program on "Research, especially in Colleges and Professional Schools," arranged by Maynard M. Metcalf, secretary of the sub-committee on research in educational institutions, of the committee of one hundred on research. Research as an attitude of mind, research in medical schools, research in jurisprudence and research in colleges were presented by John C. Merriam, Florence R. Sabin, Walton W. Cook, Maynard M. Metcalf and H. B. Goodrich. An outcome of this session was the subsequent adoption, by the association council, of a resolution inviting several other organizations to name representatives to meet with a representative of the American Association, to consider the encouragement of research in American colleges. (See Legislative and Executive Proceedings, as printed on page 87 in this issue of SCIENCE.)

The Tuesday evening session was devoted to the Fifth Annual Sigma Xi Lecture, given by Mr. Herbert Hoover, on "The Nation and Science." This inspiring address appeared in SCIENCE for January 14.

Two general sessions occurred on Wednesday afternoon. One was devoted to a program on "Hydrobiology," dealing with life in rivers and lakes especially. Papers were presented by Stephen A. Forbes, Chancey Juday, A. G. Huntsman and Albert Mann. It may be predicted that this branch of biology will be increasingly cultivated. The other general session of Wednesday afternoon was devoted to an illustrated, non-technical lecture on "The Unity of the Universe," by Heber D. Curtis.

At the evening session on Wednesday was given an illustrated lecture on "Cambridge University," by George H. F. Nuttall, Quick professor of biology and director of the Molteno Institute for Research in Parasitology, in the University of Cambridge.

A general session on Thursday afternoon was devoted to a program illustrating some of the relations of science to education, arranged by Otis W. Caldwell, chairman of the association's committee on the rôle of science in education. After an introductory statement by Edward A. Wildman, director of the division of science of the high schools of Philadelphia, the work of the committee on the rôle of science was briefly discussed by its chairman. Then followed papers on "The Vocation of the Scientist," by L. H. Bailey; "Biology and Better Beef," by Wilber A. Cochel; and "Recent Contributions of Chemistry to Human Nutrition," by Henry C. Sherman.

An illustrated lecture on "The Geographic Conditions of Ancient Greek Culture" was given at the Thursday evening session, by J. L. Myres, general secretary of the British Association for the Advancement of Science and special representative of the British Association at the Philadelphia meeting.

The four non-technical lectures specially planned for high-school students, for which some fifty thousand printed announcements had been previously distributed in the schools of Philadelphia, occurred on the evenings of Monday, Tuesday, Wednesday and Thursday of convocation week, in the auditorium of the newly opened Girls' Trade School. Details for these lectures were very efficiently arranged by G. E. Nitzsche, recorder of the University of Pennsylvania, and George Wheeler, assistant superintendent of the Philadelphia public schools, to both of whom the association is very grateful for this opportunity to bring the science meeting to the minds of the youth of Philadelphia. All the lectures were well attended and this experiment was remarkably successful. The lectures were as follows:

On Monday evening an illustrated lecture, with elaborate experimental demonstrations, on "Radio Communication," was given by Raymond Morgan, of the University of Pennsylvania.

On Tuesday evening Clyde Fisher, of the American Museum of Natural History, New York City, gave a lecture on "A Journey in Lapland," illustrated by original colored lantern slides and motion pictures.

On Wednesday evening George A. Dorsey, of the New School of Social Research, New York City, gave a lecture on "Why We behave like Human Beings."

On Thursday evening a lecture on "Wild Life in Wildest America," illustrated by motion pictures, was given by Norman McClintock, of the University of Pittsburgh. He dealt with the life of the Shiras Moose and other wild animals in the region of the headwaters of the Yellowstone, in Wyoming.

THE SECRETARIES' DINNER AND CONFERENCE

On Sunday evening, December 26, the secretaries of the association sections and of the organizations meeting with the association dined, at the Bellevue-Stratford Hotel, with the members of the executive committee and joined in a conference after the dinner. This dinner of the executive committee and the secretaries has recently become established as an informal but very important feature of the annual meeting. It is complimentary on the part of the association. It offers a much needed opportunity for exchange of ideas among those who are most active in directing the affairs of the association. Twenty-eight were present and the discussions were animated and prolonged.

GENERAL OFFICERS FOR THE PHILADELPHIA MEETING

President

L. H. Bailey, 103 Sage Place, Ithaca, N. Y.

Retiring President

M. I. Pupin, Columbia University, New York City.

Vice-presidents,[1] *Retiring Vice-presidents and Secretaries of the Sections*

Section A (Mathematics):
Vice-president, Edward V. Huntington, Harvard University, Cambridge, Mass.
Retiring Vice-president, W. H. Roever, Washington University, St. Louis, Mo.
Secretary, R. C. Archibald, Brown University, Providence, R. I.

Section B (Physics):
Vice-president, William Duane, Bio-Physical Laboratories, Harvard University, Boston, Mass.
Retiring Vice-president, H. M. Randall, University of Michigan, Ann Arbor, Mich.
Secretary, A. L. Hughes, Washington University, St. Louis, Mo.

Section C (Chemistry):
Vice-president, Lauder W. Jones, Princeton University, Princeton, N. J.
Retiring Vice-president, H. B. Cady, University of Kansas, Lawrence, Kans.
Secretary, Gerhard Dietrichson, Massachusetts Institute of Technology, Cambridge, Mass.

Section D (Astronomy):
Vice-president, Robert G. Aitken, Lick Observatory, Mt. Hamilton, Calif.
Retiring Vice-president, A. E. Douglass, University of Arizona, Tucson, Ariz.
Secretary, Philip Fox, Northwestern University, Evanston, Ill.

Section E (Geology and Geography):
Vice-president, G. H. Ashley, State Capitol, Harrisburg, Pa.
Retiring Vice-president, R. A. Daly, Harvard University, Cambridge, Mass.
Secretary, G. R. Mansfield, U. S. Geological Survey, Washington, D. C.

Section F (Zoological Sciences):
Vice-president, Winterton C. Curtis, University of Missouri, Columbia, Mo.
Retiring Vice-president, H. S. Jennings, Johns Hopkins University, Baltimore, Md.
Secretary, Geo. T. Hargitt, Syracuse University, Syracuse, N. Y.

Section G (Botanical Sciences):
Vice-president, B. M. Duggar, Missouri Botanical Garden, St. Louis, Mo.
Retiring Vice-president, Robert B. Wylie, University of Iowa, Iowa City, Iowa.
Secretary, Sam F. Trelease, Columbia University, New York City.

Section H (Anthropology):
Vice-president, R. Bennett Bean, University of Virginia, University, Va.
Retiring vice-president, C. B. Davenport, Station for Experimental Evolution, Cold Spring Harbor, N. Y.
Secretary, R. J. Terry, Washington University School of Medicine, St. Louis, Mo.

Section I (Psychology):
Vice-president, Margaret Floy Washburn, Vassar College, Poughkeepsie, N. Y.
Retiring Vice-president, C. E. Seashore, University of Iowa, Iowa City, Iowa.
Secretary, Frank N. Freeman, University of Chicago, Chicago, Ill.

Section K (Social and Economic Sciences):
Vice-president, Joseph H. Willits, University of Pennsylvania, Philadelphia, Pa.
Retiring Vice-president, F. R. Fairchild, Yale University, New Haven, Conn.
Secretary, Frederick L. Hoffman, Babson Institute, Babson Park, Mass.

Section L (Historical and Philological Sciences):[2]
Vice-president, W. Carl Rufus, University of Michigan, Ann Arbor, Mich.

[1] Vice-presidents are elected for a term of one year, from the close of one annual meeting to the close of the next following one.

[2] Section L has not yet been wholly organized. The recently affiliated History of Science Society represents a part of the history portion of this section. The recently organized and affiliated Linguistic Society of America was asked to take charge of programs on linguistics, but no program in this field was presented this year, since that society met elsewhere.

Retiring Vice-president, W. A. Oldfather, University of Illinois, Urbana, Ill.

Secretary, Frederick E. Brasch, Library of Congress, Washington, D. C.

Section M (Engineering):

Vice-president, C. R. Richards, Lehigh University, Bethlehem, Pa.

Retiring Vice-president, C. R. Richards, Lehigh University, Bethlehem, Pa.

Secretary, N. H. Heck, U. S. Coast and Geodetic Survey, Washington, D. C.

Section N (Medical Sciences):

Vice-president, Rufus I. Cole, Rockefeller Hospital, New York City.

Retiring Vice-president, A. J. Carlson, University of Chicago, Chicago, Ill.

Secretary, A. J. Goldforb, College of the City of New York, New York City.

Section O (Agriculture):

Vice-president, C. F. Marbut, U. S. Department of Agriculture, Washington, D. C.

Retiring Vice-president, C. V. Piper, *deceased.*

Secretary, P. E. Brown, Iowa State College, Ames, Iowa.

Section Q (Education):

Vice-president, Melvin E. Haggerty, University of Minnesota, Minneapolis, Minn.

Retiring Vice-president, Otis W. Caldwell, Columbia University, New York City.

Secretary, A. S. Barr, University of Wisconsin, Madison, Wis.

Permanent Secretary[3]

Burton E. Livingston, Johns Hopkins University, Baltimore, Md. (Association mail address: Smithsonian Institution Building, Washington, D. C.)

General Secretary[3]

W. J. Humphreys, U. S. Weather Bureau, Washington, D. C.

Treasurer[3]

John L. Wirt, Carnegie Institution of Washington, Washington, D. C.

Secretary of the Council and Program Editor

Sam F. Trelease, Columbia University, New York City.

Executive Assistant

Sam Woodley, Smithsonian Institution Building, Washington, D. C.

Auditor

R. B. Sosman, Geophysical Laboratory, Washington, D. C.

News Manager

Austin H. Clark, U. S. National Museum, Washington, D. C.

Manager of Exhibition

H. S. Kimberly, Smithsonian Institution Building, Washington, D. C.

Members of the Executive Committee of the Council for the Calendar Year 1926[4]

See the Council Roll and the Roll of the Executive Committee given below.

[3] The permanent secretary, the general secretary and the treasurer are each elected for a term of four years; their terms of office expire at the end of the fifth New York meeting.

THE COUNCIL ROLL AT PHILADELPHIA

The affairs of the association are entirely in the charge of the council, which consists of the president, the fifteen vice-presidents, the treasurer, the general secretary, the permanent secretary, the fifteen section secretaries, the council representatives of the affiliated societies and state academies, the eight selected council members and those members of the executive committee who are not otherwise members of the council. Past presidents of the association and the presidents of the divisions and local branches are officially invited to attend council sessions.

Each affiliated organization is asked each year, about March 1, to name its council representative or representatives for the year and for the next annual meeting. Each representative holds office till his successor is named and each is *ex officio* a member of the section committee to which his scientific work is most closely related.

It is desirable that affiliated organizations should name as their council representatives persons who are likely to attend the annual meeting and who will be able to take part in the proceedings of the council.

The complete roll of the council for the eighty-third meeting is shown below, arranged alphabetically. Each member's name is followed by an italic phrase, showing his status in the council. The record of attendance at the five Philadelphia sessions is shown by numerals that precede the members' names, these numbers representing, respectively, the sessions on Monday, Tuesday, Wednesday, Thursday and Friday, December 27 to December 31. Thus, the numerals 2 and 3 before a name indicate that the member whose name is so marked was present at the Tuesday and Wednesday sessions but was absent from the other sessions. Each member's record of attendance was submitted to him by mail before this list was prepared, with the request that needed corrections be made, but it is possible that a few errors may still require correction. In such cases the permanent secretary's office should be promptly informed, so that the official record of attendance at the Philadelphia council sessions may be entirely correct. A few substitutes were named for members who could not come

[4] The number in parentheses denotes the calendar year at the end of which the member's term of office expires.

to Philadelphia, and these are named and so indicated in the list.

The council holds sessions only at the annual meetings of the association and attendance at these sessions should be as full as possible. The published records of attendance at council sessions furnish a means by which members of the association and of the affiliated organizations may be informed as to which council members are most regular in attendance and which ones name substitutes when they are themselves unable to attend. It should be noted that the first council session, on the afternoon preceding the opening session of the annual meeting, is generally the most important, but weighty matters are considered at the later session as well.

MEMBERS AND INVITED GUESTS OF THE COUNCIL FOR THE FIFTH PHILADELPHIA MEETING, WITH NOTES AS TO THEIR STATUS AND RECORDS OF THEIR ATTENDANCE

Aitken, Robert G., *Vice-President for Section D.*
1, 2, 3, 4, 5 Alexander, William H., *Rep. Ohio Acad. Science.*
Anderson, John E., *Rep. Amer. Psychol. Assoc.*
1 Archibald, R. C., *Secretary of Section A.*
1 Ashley, G. H., *Vice-President for Section E.*
1, 2, 3, 4, 5 Bailey, L. H., *President of the Association.*
Baker, O. E., *Rep. Assoc. Amer. Geographers.*
Bakke, A. L., *Rep. Honor Soc. Phi Kappa Phi.*
Ball, C. R., *Rep. Honor Soc. Phi Kappa Phi.*
3 Barr, A. S., *Secretary of Section Q.*
Battle, H. B., *Rep. Amer. Oil Chemists' Soc.*
4 Bean, R. Bennett, *Vice-President for Section H and Rep. Virginia Acad. Science.*
1, 2, 4, 5 Bergey, David H., *Rep. Soc. Amer. Bacteriologists.*
Berkey, Charles P., *Rep. Geol. Soc. Amer.* (Fred. E. Wright, substitute for the Philadelphia meeting.)
Boggs, G. H., *Rep. Georgia Acad. Science.*
Boring, Edwin G., *Rep. Amer. Psychol. Assoc.*
Bowie, William, *Rep. Amer. Soc. Civil Engineers.*
Bowman, Isaiah, *Rep. Amer. Geographical Soc.*
1, 2, 3, 4, 5 Brasch, Frederick E., *Secretary of Section L.*
1, 4 Breed, Robert S., *Rep. Soc. Amer. Bacteriologists.*
Britton, W. E., *Rep. Amer. Assoc. Econ. Entomol.*
3, 4, 5 Brown, P. E., *Secretary of Section O.*
Buchner, E. F., *Rep. National Soc. College Teachers of Education.*
2 Cady, H. P., *Rep. History Science Soc.* (Substitute for F. B. Dains.)
Cairns, W. D., *Rep. Math. Assoc. Amer.* (C. H. Yeaton, substitute for the Philadelphia meeting.)
Cajori, Florian, *Rep. History Science Soc.*
1, 2, 4, 5 Caldwell, Otis W., *Rep. National Education Assoc.*
Calver, Homer N., *Rep. Amer. Public Health Assoc.*
1, 3, 4 Calvert, P. P., *Rep. Entomol. Soc. Amer.*
Campbell, W. W., *Past President (1915).*
Case, E. C., *Rep. Michigan Acad. Science.*
1, 2, 4, 5 Cattell, J. McKeen, *Exec. Comm. Member and Past President (1924).*
Chamberlin, T. C., *Past President (1908).*
Chance, H. M., *Rep. Amer. Inst. Mining and Metallurgical Engineers.*
1, 3, 4 Clinton, G. P., *Rep. Amer. Phytopathol. Soc.*
1, 2, 3 Cole, Leon J., *Rep. Amer. Genetic Assoc.*
2 Cole, Rufus I., *Vice-President for Section N.*
Compton, K. T., *Rep. Optical Soc. Amer.*
Coulter, John Merle, *Rep. Amer. Assoc. Univ. Professors and Past President (1918).*
3 Courtis, Stuart L., *Rep. National Soc. Study of Education.*
Crittenden, E. C., *Rep. Illuminating Engineering Soc.*
1, 2, 3, 4, 5 Crocker, William, *Rep. Bot. Soc. Amer.*
1, 2, 3, 4 Cunningham, Bert, *Rep. North Carolina Acad. Science.*
1, 3 Curtis, Winterton C., *Vice-President for Section F.*
Dains, F. B., *Rep. History Science Soc.* (H. P. Cady, substitute for Philadelphia meeting.)
1, 3, 4 Dean, George A., *Rep. Amer. Assoc. Econ. Entomol.*
Dellinger, J. H., *Rep. Inst. Radio Engineers.*
1, 2, 3, 4 Dietrichson, Gerhard, *Secretary of Section C.*
4 Drushel, J. Andrew, *Rep. Amer. Nature-Study Soc.*
Duane, William, *Vice-President for Section B.*
Dublin, L. I., *Rep. Amer. Public Health Assoc.*
3, 4 Duggar, B. M., *Vice-President for Section G and Rep. Amer. Soc. Naturalists.*
1, 2, 3, 4, 5 Eichelberger, W. S., *Rep. Amer. Astronom. Soc.*
1, 2, 3 Eiesland, John A., *Rep. West Virginia Acad. Science.*
Ellery, Edward, *Rep. Sigma Xi.*
1, 2, 3, 4 Enders, Howard E., *Rep. Indiana Acad. Science.*
1, 4, 5 Estabrook, Arthur H., *Rep. Eugenics Res. Assoc.*
Fairchild, H. L., *Elected Member and Exec. Comm. Member.*
1, 2, 3, 4 Fenneman, Nevin M., *Rep. Assoc. Amer. Geographers.*
Flagg, A. L., *President of the Southwestern Division.*
Flexner, Simon, *Past President (1919).*
1, 2, 4 Focke, T. M., *Rep. Math. Assoc. Amer.*
1, 2, 3, 4, 5 Fox, Philip, *Secretary of Section D and Rep. Astronom. Soc. Pacific.*
Freeman, Frank N., *Secretary of Section I.*
1, 2, 3, 4, 5 Garber, R. J., *Rep. Amer. Soc. Agron.*
4 Gardner, Wright A., *Rep. Alabama Acad. Science.*
Gerould, John H., *Rep. New Hampshire Acad. Science.* (Gordon F. Hull, substitute for the Philadelphia meeting.)
4 Gibbs, George, *Rep. Amer. Soc. Civil Engineers.*
1 Gibson, Arthur, *Rep. Canadian Soc. Tech. Agriculturists.*
1, 2 Goldforb, A. J., *Secretary of Section N.*
3, 4 Haggerty, Melvin E., *Vice-President for Section Q.*
Hall, M. C., *Rep. Amer. Soc. Parasitologists.* (E. E. Tyzzer, substitute for the Philadelphia meeting.)
Hallowell, A. I., *Rep. Amer. Anthropol. Assoc.*

2, 3, 4, 5 Hancock, Harris, *Rep. Amer. Assoc. Univ. Professors.*
1, 2, 3, 4 Hargitt, Geo. T., *Secretary of Section F.*
1, 2, 4 Heck, N. H., *Secretary of Section M.*
Hedrick, William A., *Rep. Amer. Fed. Teachers of Math. and Nat. Sciences.*
Hegner, R. W., *Rep. Amer. Soc. Naturalists.*
2, 4 Hibbard, R. P., *Rep. Amer. Soc. Plant Physiologists.*
1 Hoffman, F. L., *Secretary of Section K.*
Hollis, Ira N., *Rep. Amer. Soc. Mech. Engineers.*
1, 2, 3, 4 Howard, L. O., *Elected Member and Past President (1920).*
2 Hughes, A. L., *Secretary of Section B.*
1, 2, 3, 4 Hull, Gordon F., *Rep. New Hampshire Acad. Science.* (Substitute for John H. Gerould.)
Humphreys, Alex. C., *Rep. Amer. Soc. Mech. Engineers.*
1, 2, 3, 4, 5 Humphreys, W. J., *General Secretary of the Association and Rep. Amer. Meteorol. Soc.*
3 Huntington, Edward V., *Vice-President for Section A.*
4 Illick, J. S., *Rep. Soc. Amer. Foresters.*
1, 2, 3, 5 Ingraham, M. H., *Rep. Amer. Math. Soc.* (Substitute for R. G. D. Richardson.)
1, 3, 4 Jackson, Hartley H. T., *Rep. Amer. Soc. Mammalogists.*
2, 3, 4 Johannsen, O. A., *Rep. Entomol. Soc. Amer.*
Jones, Arthur J., *Rep. National Soc. College Teachers of Education.*
1, 4 Jones, Lauder W., *Vice-President for Section C.*
Jordan, David Starr, *Past President (1909).*
1, 3, 4 Juday, Chancey, *Rep. Wisconsin Acad. Sciences.*
Kellogg, Vernon, *Exec. Comm. Member.*
Knipp, Charles T., *Rep. Illinois Acad. Science.*
1 Kober, George M., *Rep. Amer. Medical Assoc.*
1, 2, 4 Koch, Julius A., *Rep. Amer. Pharmaceutical Assoc.*
3, 4 La Rue, G. R., *Rep. Amer. Microscopical Soc.*
1, 2 Laughlin, H. H., *Rep. Eugenics Res. Assoc.*
Lawson, Andrew C., *Rep. Geol. Soc. Amer.*
1, 2, 3, 4 Leighty, C. E., *Rep. Amer. Genetic Assoc.*
1 Lidbury, F. A., *Rep. Amer. Electrochem. Soc.*
1, 2, 3, 4, 5 Livingston, Burton E., *Permanent Secretary of the Association.*
1, 3, 4 Loomis, F. B., *Rep. Paleontological Soc. Amer.*
1, 2, 3, 4, 5 Love, H. H., *Rep. Amer. Soc. Agron.*
1 MacDougal, D. T., *Elected Member.*
1, 2 Macelwane, James B., *Rep. Seismol. Soc. Amer.*
3, 4 Mansfield, G. R., *Secretary of Section E.*
1, 4 Marbut, C. F., *Vice-President for Section O.*
1, 2, 3, 4, 5 Mason, J. Alden, *Rep. Linguistic Soc. Amer.*
1, 2, 3, 4, 5 McGill, John T., *Rep. Tennessee Acad. Science.*
1, 2, 3, 4 McHatton, T. H., *Rep. Amer. Soc. Horticultural Science.*
McMurrich, J. Playfair, *Rep. Amer. Assoc. Anatomists and Past President (1922).*
Merriam, John C., *Elected Member.*
1, 3 Metcalf, M. M., *Rep. Amer. Soc. Zoologists.*
Michelson, A. A., *Past President (1910).*
1, 2, 4 Middleton, Austin R., *Rep. Kentucky Acad.* (Substitute for A. M. Peter.)
1 Miller, Dayton C., *Rep. Amer. Physical Soc.*
Miller, G. A., *Elected Member.*
Miller, W. Lash, *Rep. Amer. Electrochem. Soc.*
1 Mitchell, H. H., *Rep. Amer. Math. Soc.*
Moore, E. H., *Past President (1921).*
4, 5 Morehouse, D. W., *Rep. Iowa Acad. Science.*
Moseley, H. W., *Rep. New Orleans Acad. Sciences.*
1, 2 Moulton, F. R., *Exec. Comm. Member and Rep. Sigma Xi.*
1, 2, 3 Nabours, R. K., *Rep. Kansas Acad. Science.*
2, 3, 4 Neal, H. V., *Rep. Amer. Soc. Zoologists.*
Nicholas, Francis C., *Rep. Maryland Acad. Sciences.*
Nichols, E. L., *Past President (1907).*
Norris, James F., *Rep. Amer. Chem. Soc.*
Noyes, A. A., *President of the Pacific Division.*
Noyes, W. A., *Exec. Comm. Member.*
Oldfather, W. A., *Elected Member.*
Parsons, Charles L., *Rep. Amer. Chem. Soc.*
Pearse, A. S., *Rep. Ecol. Soc. Amer.*
Peltier, G. L., *Rep. Nebraska Acad. Science.* (Paul B. Sears, substitute for Philadelphia meeting.)
Peter, A. M., *Rep. Kentucky Acad. Science.* (Austin R. Middleton substitute for the Philadelphia meeting.)
2 Piersol, George M., *Rep. Amer. Med. Assoc.*
4 Pupin, M. I., *Exec. Comm. Member, Rep. Inst. Electrical Engineers, and Past President (1925).*
1, 2, 3, 4 Reddick, Donald, *Rep. Amer. Phytopath. Soc.*
Remsen, Ira, *Past President (1902).*
5 Reynolds, E. S., *Rep. North Dakota Academy of Science.*
1, 2, 3, 4, 5 Richards, A., *Rep. Oklahoma Acad. Science.*
4 Richards, C. R., *Vice-President for Section M.*
Richards, Theodore W., *Past President (1917).*
Richardson, R. G. D., *Rep. Amer. Math. Soc.* (M. H. Ingraham substitute for the Philadelphia meeting.)
Richtmyer, F. K., *Rep. Optical Soc. Amer.*
Rufus, W. Carl, *Vice-President for Section L.*
Sapir, E., *Rep. Amer. Anthropol. Assoc.*
1 Sauveur, Albert, *Rep. Amer. Inst. Mining and Metallurgical Engineers.*
3, 4 Schramm, J. R., *Rep. Bot. Soc. Amer.*
2 Schroeder, E. C., *Rep. Amer. Veterinary Med. Assoc.*
4 Sears, Paul B., *Rep. Nebraska Acad. Sci.* (Substitute for G. L. Peltier.)
Senior, H. D., *Rep. Amer. Assoc. Anatomists.*
Sharp, Clayton H., *Rep. Illuminating Engineering Soc.*
2, 3, 4, 5 Slocum, Frederick, *Rep. Amer. Astronom. Soc.*
2, 3, 4 Stewart, G. W., *Elected Member.*
Stone, Witmer, *Rep. Amer. Soc. Mammalogists.*
Studebaker, J. W., *Rep. National Education Assoc.*
1, 2 Taylor, John B., *Rep. Amer. Inst. Electrical Engineers.*
3 Terry, R. J., *Secretary of Section H.*
Tillotson, E. Ward, *Rep. Amer. Ceramic Soc.*
Townley, S. D., *Rep. Seismol. Soc. Amer.*
1, 2, 3, 4, 5 Trelease, Sam F., *Secretary of Section G.*
1, 2, 3, 4, 5 True, Rodney H., *Elected Member.*
2, 3 Tyzzer, E. E., *Rep. Amer. Soc. Parasitologists.* (Substitute for M. C. Hall.)
1, 3, 4 Van Cleave, H. J., *Rep. Amer. Microscopical Soc.*
Van Horn, Frank R., *Rep. Mineralogical Soc. Amer.*
Walcott, Charles D., *Past President (1923).*
1, 2, 3, 4, 5 Ward, Henry B., *Exec. Comm. Member.*

Warwick, C. L., *Rep. Amer. Soc. Testing Materials.*
2 Washburn, Margaret Floy, *Vice-President for Section I.*
Weaver, J. E., *Rep. Ecol. Soc. Amer.*
1 Webb, Harold W., *Rep. Amer. Physical Soc.*
Welch, William H., *Past President (1906).*
1, 2, 4 Whipple, Guy M., *Rep. National Soc. Study of Education.*
White, David, *Rep. Paleontological Soc. Amer.*
Willits, Joseph H., *Vice-President for Section K.*
Wilson, Edmund B., *Past President (1913).*
3 Wilson, Edwin B., *Exec. Comm. Member.*
Wirt, John L., *Treasurer of the Association.*
1, 2 Wright, Fred. E., *Rep. Geol. Soc. Amer.* (Substitute for Charles P. Berkey.)
1, 2, 3, 4 Yeaton, C. H., *Rep. Math. Assoc. Amer.* (Substitute for W. D. Cairns.)

THE ROLL OF THE EXECUTIVE COMMITTEE AT PHILADELPHIA

The executive committee held sessions on Monday, Tuesday, Wednesday and Thursday mornings. The first session was in the Bellevue-Stratford Hotel, while the others were in the council room in Bennett Hall, the University of Pennsylvania. Following is the roll of the committee. The numbers preceding each name indicate the sessions at which the member was present, as in the case of the council roll above. The number in parenthesis after each name denotes the calendar year at the end of which the member's term of office was to expire. Drs. Cattell and Ward automatically retired from the committee at the end of this Philadelphia meeting. They were reelected to succeed themselves.

1, 2, 3, 4 J. McK. Cattell (1926), *chairman*, Garrison-on-Hudson, N. Y.
1, 2, 3, 4 L. H. Bailey (1926), president of the association, Ithaca, N. Y.
1, 2, 3 W. J. Humphreys (1928), general secretary of the association, Washington, D. C.
1, 2, 3, 4 Burton E. Livingston (1928), permanent secretary of the association, Baltimore, Md., and Washington, D. C.
Herman L. Fairchild (1927), Rochester, N. Y.
2, 3 Vernon Kellogg (1928), Washington, D. C.
2 F. R. Moulton (1929), Chicago, Ill.
W. A. Noyes (1927), Urbana, Ill.
1, 3, 4 Michael I. Pupin (1929), New York City.
1, 2, 3, 4 Henry B. Ward (1926), Urbana, Ill.
3 Edwin B. Wilson (1928), Boston, Mass.

LEGISLATIVE AND EXECUTIVE PROCEEDINGS AT PHILADELPHIA

The executive committee of the council met in the Bellevue-Stratford Hotel on Monday morning, December 27, and held a session in the council room at the University of Pennsylvania following the council meeting on each of the three succeeding days. The council met in the council room on the afternoon of Monday and at 9 on Tuesday, Wednesday, Thursday and Friday. No business was transacted at any of the general sessions of the Philadelphia meeting. The following paragraphs summarize the Philadelphia business proceedings:

(1) The council minutes of January 1 and of December 27, 28, 29 and 30, 1926, were approved.

(2) The audited report of the treasurer for September 30, 1926, was accepted by the council and ordered to be printed in SCIENCE in the usual manner.

(3) The audited financial report of the permanent secretary for September 30, 1926, was accepted and ordered to be printed in SCIENCE.

(4) The report of the secretary-treasurer of the Pacific Division was presented to the council and was ordered to be printed in SCIENCE as usual.

(5) The treasurer, with the advice of the finance committee, was specially empowered by the council to dispose of any securities belonging to the association, for the purpose of reinvestment.

(6) A treasurer's reserve fund was established by the council, to amount generally to about $2,500, and it was voted that unexpended balances of appropriable funds in the hands of the treasurer be added to the reserve fund at the end of each fiscal year. The reserve fund is to be temporarily invested or held in the savings bank, and interest received from it is to be added to the fund itself.

(7) The following appropriations from the treasurer's available funds were made by the council:

$3,000 for allotment by the Committee on Grants.
$ 500 to the Naples Zoological Station.
$ 200 to the Annual tables of Physical and Chemical Constants.
$1,000 for the operations of the Committee of One Hundred on Scientific Research.

(8) The following three members were elected to emeritus life membership according to the provisions of the will of the late Jane M. Smith:

Monroe B. Snyder, member since 1875 and fellow since 1882.
Ormond Stone, member since 1875 and fellow since 1876.
George E. Blackham, member since 1876 and fellow since 1883.

(9) Two hundred and thirty-eight fellows of the association were elected by the council, on nominations previously approved by the sections in the regular way. These are distributed among the sections as follows:

Section A, 3	Section F, 3
Section B, 28	Section G, 45
Section C, 2	Section L, 1
Section D, 3	Section N, 123
Section E, 28	Section O, 2

(10) With the approval of the editor of SCIENCE and *The Scientific Monthly* the council voted that any member of the association may receive either of these journals, in addition to the one received on account of his membership, on payment of three dollars. That is, any person may have membership and both journals by paying

$8.00 per year to the permanent secretary's office. This new rule became effective at once.

(11) Professor J. L. Myres, general secretary of the British Association for the Advancement of Science and delegate from the British Association to the fifth Philadelphia meeting, was invited to attend the council sessions at Philadelphia, as well as the scientific sessions at this meeting. The council expressed its hearty thanks to Professor Myres for his illustrated lecture on "The Geographic Conditions of Ancient Greek Culture," given at the general session Thursday evening.

(12) The council elected Dr. A. E. Kennelly as representative of the American Association in the Committee on Graphic Presentation, which is being organized by the American Society of Mechanical Engineers.

(13) The resignation of Dr. Frederick L. Hoffman as secretary of Section K was accepted by the council, with the expression of its hearty appreciation of the valuable work he has done for Section K and for the association.

(14) The council heartily approved the following telegram sent on Tuesday:

HON. NICHOLAS LONGWORTH,
Speaker, House of Representatives,
Washington, D. C.

The establishment of a National Arboretum at Washington was approved by the American Association for the Advancement of Science at its meeting two years ago. The president of the association went to Washington and presented the views of this organization in person to the House Committee on Agriculture, which had this matter under consideration. The Committee reported the arboretum bill favorably. The whole country needs this research institution at the present time for the proper development and advancement of forestry and agriculture. On behalf of thousands of scientific men gathered here from all parts of the country I earnestly request that you use your powerful influence to assure the passage of the National Aboretum bill at this time.

(Signed) L. H. BAILEY,
President, American Association
for the Advancement of Science.

(15) The following resolution was adopted by the council:

Resolved: That the permanent secretary is instructed to consider carefully such programs of participating organizations as may be submitted for the General Program of any meeting. Only such programs or parts thereof shall be printed in the general program of any meeting as are of general or scientific interest.

(16) On nominations secured by a preliminary, written nominating ballot, Dr. Arthur A. Noyes was unanimously elected to be president of the association.

(17) The new vice-presidents for the sections were elected, on nominations by the respective sections. Their names are given on page 92.

(18) On nominations by a nominating committee Dr. David White and Dr. L. H. Dickson were elected members of the council, their terms of office to expire at the end of December, 1930.

(19) Dr. J. McK. Cattell and Dr. Henry B. Ward were reelected members of the executive committee, their terms of office to expire at the end of December, 1930.

(20) Mr. Herbert Gill was reelected to the Finance Committee, his term of office to expire at the end of December, 1930.

(21) On nomination from a nominating committee, Dr. W. Lash Miller (representing chemistry) and Dr. Oswald Veblen (representing mathematics) were elected to the Committee on Grants for Research, their terms of office to expire at the end of December, 1930.

(22) Dr. D. T. MacDougal was nominated to Science Service, for reelection as a trustee of Science Service representing the American Association for the Advancement of Science, his term of office to expire at the end of 1929.

(23) On nomination by the section committee of Section H (Anthropology), Dr. Fay Cooper Cole was elected secretary of Section H, to complete the unexpired term of Dr. R. J. Terry, who had been elected vice-president for the section. Dr. Cole's term of office is to expire at the end of December, 1928.

(24) It was voted that the vacancy in the secretaryship of Section K (Social and Economic Sciences), created by the resignation of Dr. Hoffman, be referred to the executive committee, with power.

(25) The council adopted a recommendation by the executive committee favoring a continuation of popular lectures following the Philadelphia meeting, in so far as arrangements for such lectures may be found to be feasible and desirable by the Local Committee on Arrangements for this meeting.

(26) The council adopted a recommendation of the executive committee favoring popular lectures before and after the Nashville meeting, as well as during the meeting, if the Local Committee for the Nashville meeting finds it feasible and desirable to arrange for such lectures.

(27) Dr. W. S. Leathers, of Vanderbilt University, was elected chairman of the Local Committee on Arrangements for the Nashville meeting.

(28) On recommendation of the executive committee, the council adopted the following resolution, which had been unanimously recommended by the general session on Research in Colleges and Professional Schools, held Tuesday afternoon under the auspices of the Committee of One Hundred on Scientific Research.

Resolved: That the American Association for the Advancement of Science invites the National Research Council, the American Council on Education, the Social Science Research Council and the American Council of Learned Societies to name each a representative to meet with a representative of the American Association for the Advancement of Science, to consider and enter upon definite plans for encouraging and promoting research in American colleges, this joint committee being given power to add to its own number.

(29) On recommendation of the executive committee, the council elected Dr. Maynard M. Metcalf to be the representative of the American Association for the Advancement of Science in the joint committee proposed in the resolution of the last paragraph.

(30) The following resolution was adopted, on recommendation of the executive committee:

Resolved: That the council of the American Association for the Advancement of Science asks that the Con-

gress of the United States take suitable action with regard to cases in which persons in government service meet with serious incapacity or death on account of dangers incurred in carrying out experiments in the interest of the nation and science.

(31) The council adopted a resolution expressing its gratification at the great success of the fifth meeting held in Philadelphia, where the association held its first meeting in 1848, and also expressing its appreciation of the financial aid and other invaluable cooperation given by the University of Pennsylvania, which generously and unreservedly placed its facilities at the disposal of the association. The council likewise expressed its pleasure in thanking the Drexel Institute, the Franklin Institute, the Academy of Natural Sciences, the American Philosophical Society and other institutions, and the people and the press of Philadelphia for their generous cooperation and hospitality. The council also recorded its very appreciative thanks to the members of the local committee on arrangements for this meeting, without whose long-continued and devoted services the intricate and exacting needs for the meeting could not have been met.

(32) The council unanimously adopted a resolution expressing its appreciative thanks to Dr. L. H. Bailey for the fine and efficient manner in which he had performed the duties of chairman of the council at the Philadelphia sessions.

REPORT OF THE TREASURER FOR 1925–26

In compliance with Article III, Section 6, of the By-Laws and by direction of the council, the treasurer has the honor to submit the following report for the fiscal year ending September 30, 1926.

The total of cash receipts during the year is $8,701.25. Included in the amount is an item of $2,100 representing 21 life membership fees at $100 each, thereby increasing the endowment fund to the total amount of $140,876.66 as shown by balance sheet. Disbursements made in accordance with direction of the council and recommendation of the finance committee amount in the aggregate to $22,048.98. These include $15,049.17 due to the purchase of the following bonds for account of the endowment fund, in conformity with the action of the Finance Committee at its meeting held on February 3, 1926:

$5,000 Am. Tel. & Tel. Coll. 5s 1946	$ 5,107.50	
5,000 B. & O. R. R. ref. & gen. mtg. 5s 2000	4,766.67	
5,000 Pac. Gas & Elec. 1st ref. 5½s 1952	5,175.00	
		$15,049.17

Accrued interest purchased on bonds amounted to $93.33. The bonds have been registered and placed in the safe deposit box of the association.

The total amount of funds of the association, consisting of cash, cost value of securities, appraised value of securities received from the Colburn fund and mortgages, is $153,566.41.

The details of receipts, disbursements and disposition of funds are shown in the following itemized statement.

Respectfully submitted,

(Signed) JOHN L. WIRT,
Treasurer

October 1, 1926.

CASH STATEMENT
(October 1, 1925, to September 30, 1926)

Receipts

1925 Oct. 1	Balance from last report		$25,589.50
	21 Life Membership Fees		2,100.00
	Interest on Securities	$ 4,689.25	
	Interest on Jane Smith Fund	300.00	
	Interest on Mortgage	1,200.00	
	Interest on Bank Balance	412.70	6,601.95
			$34,291.45

Disbursements

Investments:			
$5,000 Am. Tel. & Tel. Coll. 5s 1946		$ 5,107.50	
$5,000 B. & O. ref. & gen. 5s 2000		4,766.67	
$5,000 Pac. Gas & El. 1st ref. 5½s 1952		5,175.00	
		$15,049.17	
Interest purchased		93.33	$15,142.50
Grants allotted by Committee on Grants:			
Edward J. Wood		$ 150.00	
C. L. Parmenter		250.00	
S. O. Mast		300.00	
Geo. H. Shull		300.00	
Bruce Fink		300.00	
Clifford H. Farr		250.00	
W. R. Maxon		300.00	
Henry B. Collins		250.00	
William H. Cole		150.00	
C. I. Reed		200.00	
R. S. Breed		300.00	
Roy L. Moodie		150.00	
Josephine E. Tilden		80.00	2,980.00
Allotments by Executive Committee or Council:			
W. D. Harkins (Newcomb Cleveland Research)		$ 300.00	
Naples Zoological Station		500.00	
International Annual Tables (Natl. Research Coun.)		200.00	
Ecological Society of America		25.00	
Committee of 100		354.48	1,379.48
Prize Fund, Dayton C. Miller			1,000.00
Jane M. Smith Fund, 3 Emeritus Life Memberships			300.00
Life Membership Fund, 409 Subscriptions to SCIENCE			1,227.00
Safe Deposit Box for Securities			20.00
			$22,048.98
Cash in Bank			12,242.47
			$34,291.45

$8.00 per year to the permanent secretary's office. This new rule became effective at once.

(11) Professor J. L. Myres, general secretary of the British Association for the Advancement of Science and delegate from the British Association to the fifth Philadelphia meeting, was invited to attend the council sessions at Philadelphia, as well as the scientific sessions at this meeting. The council expressed its hearty thanks to Professor Myres for his illustrated lecture on "The Geographic Conditions of Ancient Greek Culture," given at the general session Thursday evening.

(12) The council elected Dr. A. E. Kennelly as representative of the American Association in the Committee on Graphic Presentation, which is being organized by the American Society of Mechanical Engineers.

(13) The resignation of Dr. Frederick L. Hoffman as secretary of Section K was accepted by the council, with the expression of its hearty appreciation of the valuable work he has done for Section K and for the association.

(14) The council heartily approved the following telegram sent on Tuesday:

HON. NICHOLAS LONGWORTH,
Speaker, House of Representatives,
Washington, D. C.

The establishment of a National Arboretum at Washington was approved by the American Association for the Advancement of Science at its meeting two years ago. The president of the association went to Washington and presented the views of this organization in person to the House Committee on Agriculture, which had this matter under consideration. The Committee reported the arboretum bill favorably. The whole country needs this research institution at the present time for the proper development and advancement of forestry and agriculture. On behalf of thousands of scientific men gathered here from all parts of the country I earnestly request that you use your powerful influence to assure the passage of the National Aboretum bill at this time.

(Signed) L. H. BAILEY,
President, American Association
for the Advancement of Science.

(15) The following resolution was adopted by the council:

Resolved: That the permanent secretary is instructed to consider carefully such programs of participating organizations as may be submitted for the General Program of any meeting. Only such programs or parts thereof shall be printed in the general program of any meeting as are of general or scientific interest.

(16) On nominations secured by a preliminary, written nominating ballot, Dr. Arthur A. Noyes was unanimously elected to be president of the association.

(17) The new vice-presidents for the sections were elected, on nominations by the respective sections. Their names are given on page 92.

(18) On nominations by a nominating committee Dr. David White and Dr. L. H. Dickson were elected members of the council, their terms of office to expire at the end of December, 1930.

(19) Dr. J. McK. Cattell and Dr. Henry B. Ward were reelected members of the executive committee, their terms of office to expire at the end of December, 1930.

(20) Mr. Herbert Gill was reelected to the Finance Committee, his term of office to expire at the end of December, 1930.

(21) On nomination from a nominating committee, Dr. W. Lash Miller (representing chemistry) and Dr. Oswald Veblen (representing mathematics) were elected to the Committee on Grants for Research, their terms of office to expire at the end of December, 1930.

(22) Dr. D. T. MacDougal was nominated to Science Service, for reelection as a trustee of Science Service representing the American Association for the Advancement of Science, his term of office to expire at the end of 1929.

(23) On nomination by the section committee of Section H (Anthropology), Dr. Fay Cooper Cole was elected secretary of Section H, to complete the unexpired term of Dr. R. J. Terry, who had been elected vice-president for the section. Dr. Cole's term of office is to expire at the end of December, 1928.

(24) It was voted that the vacancy in the secretaryship of Section K (Social and Economic Sciences), created by the resignation of Dr. Hoffman, be referred to the executive committee, with power.

(25) The council adopted a recommendation by the executive committee favoring a continuation of popular lectures following the Philadelphia meeting, in so far as arrangements for such lectures may be found to be feasible and desirable by the Local Committee on Arrangements for this meeting.

(26) The council adopted a recommendation of the executive committee favoring popular lectures before and after the Nashville meeting, as well as during the meeting, if the Local Committee for the Nashville meeting finds it feasible and desirable to arrange for such lectures.

(27) Dr. W. S. Leathers, of Vanderbilt University, was elected chairman of the Local Committee on Arrangements for the Nashville meeting.

(28) On recommendation of the executive committee, the council adopted the following resolution, which had been unanimously recommended by the general session on Research in Colleges and Professional Schools, held Tuesday afternoon under the auspices of the Committee of One Hundred on Scientific Research.

Resolved: That the American Association for the Advancement of Science invites the National Research Council, the American Council on Education, the Social Science Research Council and the American Council of Learned Societies to name each a representative to meet with a representative of the American Association for the Advancement of Science, to consider and enter upon definite plans for encouraging and promoting research in American colleges, this joint committee being given power to add to its own number.

(29) On recommendation of the executive committee, the council elected Dr. Maynard M. Metcalf to be the representative of the American Association for the Advancement of Science in the joint committee proposed in the resolution of the last paragraph.

(30) The following resolution was adopted, on recommendation of the executive committee:

Resolved: That the council of the American Association for the Advancement of Science asks that the Con-

gress of the United States take suitable action with regard to cases in which persons in government service meet with serious incapacity or death on account of dangers incurred in carrying out experiments in the interest of the nation and science.

(31) The council adopted a resolution expressing its gratification at the great success of the fifth meeting held in Philadelphia, where the association held its first meeting in 1848, and also expressing its appreciation of the financial aid and other invaluable cooperation given by the University of Pennsylvania, which generously and unreservedly placed its facilities at the disposal of the association. The council likewise expressed its pleasure in thanking the Drexel Institute, the Franklin Institute, the Academy of Natural Sciences, the American Philosophical Society and other institutions, and the people and the press of Philadelphia for their generous cooperation and hospitality. The council also recorded its very appreciative thanks to the members of the local committee on arrangements for this meeting, without whose long-continued and devoted services the intricate and exacting needs for the meeting could not have been met.

(32) The council unanimously adopted a resolution expressing its appreciative thanks to Dr. L. H. Bailey for the fine and efficient manner in which he had performed the duties of chairman of the council at the Philadelphia sessions.

REPORT OF THE TREASURER FOR 1925–26

In compliance with Article III, Section 6, of the By-Laws and by direction of the council, the treasurer has the honor to submit the following report for the fiscal year ending September 30, 1926.

The total of cash receipts during the year is $8,701.25. Included in the amount is an item of $2,100 representing 21 life membership fees at $100 each, thereby increasing the endowment fund to the total amount of $140,876.66 as shown by balance sheet. Disbursements made in accordance with direction of the council and recommendation of the finance committee amount in the aggregate to $22,048.98. These include $15,049.17 due to the purchase of the following bonds for account of the endowment fund, in conformity with the action of the Finance Committee at its meeting held on February 3, 1926:

$5,000 Am. Tel. & Tel. Coll. 5s 1946	$ 5,107.50
5,000 B. & O. R. R. ref. & gen. mtg. 5s 2000	4,766.67
5,000 Pac. Gas & Elec. 1st ref. 5½s 1952	5,175.00
	$15,049.17

Accrued interest purchased on bonds amounted to $93.33. The bonds have been registered and placed in the safe deposit box of the association.

The total amount of funds of the association, consisting of cash, cost value of securities, appraised value of securities received from the Colburn fund and mortgages, is $153,566.41.

The details of receipts, disbursements and disposition of funds are shown in the following itemized statement.

Respectfully submitted,

(Signed) JOHN L. WIRT,
Treasurer

October 1, 1926.

CASH STATEMENT

(October 1, 1925, to September 30, 1926)

Receipts

1925			
Oct. 1	Balance from last report		$25,589.50
	21 Life Membership Fees		2,100.00
	Interest on Securities	$ 4,689.25	
	Interest on Jane Smith Fund	300.00	
	Interest on Mortgage	1,200.00	
	Interest on Bank Balance	412.70	6,601.95
			$34,291.45

Disbursements

Investments:		
$5,000 Am. Tel. & Tel. Coll. 5s 1946	$ 5,107.50	
$5,000 B. & O. ref. & gen. 5s 2000	4,766.67	
$5,000 Pac. Gas & El. 1st ref. 5½s 1952	5,175.00	
	$15,049.17	
Interest purchased	93.33	$15,142.50
Grants allotted by Committee on Grants:		
Edward J. Wood	$ 150.00	
C. L. Parmenter	250.00	
S. O. Mast	300.00	
Geo. H. Shull	300.00	
Bruce Fink	300.00	
Clifford H. Farr	250.00	
W. R. Maxon	300.00	
Henry B. Collins	250.00	
William H. Cole	150.00	
C. I. Reed	200.00	
R. S. Breed	300.00	
Roy L. Moodie	150.00	
Josephine E. Tilden	80.00	2,980.00
Allotments by Executive Committee or Council:		
W. D. Harkins (Newcomb Cleveland Research)	$ 300.00	
Naples Zoological Station	500.00	
International Annual Tables (Natl. Research Coun.)	200.00	
Ecological Society of America	25.00	
Committee of 100	354.48	1,379.48
Prize Fund, Dayton C. Miller		1,000.00
Jane M. Smith Fund, 3 Emeritus Life Memberships		300.00
Life Membership Fund, 409 Subscriptions to SCIENCE		1,227.00
Safe Deposit Box for Securities		20.00
		$22,048.98
Cash in Bank		12,242.47
		$34,291.45

BALANCE SHEET, SEPTEMBER 30, 1926

Assets

Investments:		
Securities	$121,323.94	
Mortgage, Washington Real Estate	20,000.00	$141,323.94
Current Assets:		
Cash	$ 12,689.75	
Less investment in Securities[2]	447.28	12,242.47
		$153,566.41

Liabilities

Endowment Fund:		
General:		
W. Hudson Stephens Fund	$ 4,381.21	
Richard T. Colburn Fund	85,586.45	
Friends of Association Fund	3,559.00	
Sustaining Membership Fees	6,000.00	
Life Membership Fees	36,350.00	
Jane M. Smith Fund	5,000.00	$140,876.66
Current Liabilities:		
Grant, carried over—L. T Royster	$ 100.00	
Allotments by Executive Committee or Council:		
Committee of 100 (Authorized—$600)	245.52	
Photosynthesis (Authorized —$500)	500.00	
Jane M. Smith Life Membership Fund	300.00	
Prize Fund	3,000.00	
SCIENCE subscription, 1927, for Life Members	1,245.00	5,390.52
Accumulated Income, Unappropriated		7,299.23
		$153,566.41

AUDITOR'S REPORT

I certify that I have audited the accounts of the Treasurer of the American Association for the Advancement of Science for the period October 1, 1925, to September 30, 1926; that the securities representing the investments of the Association have been exhibited and verified; with the exception of the Pittsburgh, Shawmut and Northern bonds, represented by a certificate of deposit, and a Washington deed of trust, represented by a receipt; and that the income therefrom has been duly accounted for.

The financial statements accompanying the report of the Treasurer are in accord with the books of the Association and correctly summarize the accounts thereof.

(Signed) ROBERT B. SOSMAN,
Auditor

November 24, 1926.

FINANCIAL REPORT OF THE PERMANENT SECRETARY FOR THE FISCAL YEAR 1925–26

(October 1, 1925, to September 30, 1926)

Dr.

To balance from last account:			
Publication fund (in Savings Dept. of the Federal-American National Bank)	$ 6,685.68		
Special fund for Committee on Place of Science in Education (in Savings Dept. of the Federal-American National Bank		947.60	
Available for appropriation:			
Checking account (in American Security and Trust Co.)	$ 425.71		
Savings account (in Federal - American National Bank)	1,282.54	1,708.25	9,341.53
To receipts from membership dues:			
Annual dues previous to 1925		125.00	
Annual dues for 1925		809.08	
Annual dues for 1926		64,657.12	
Annual dues for 1927		370.00	
Entrance fees		620.00	
Life-membership fees		2,100.00	68,681.20
To other general receipts:			
Life-membership journal subscriptions		1,227.00	
Interest on bank accounts		572.02	
Contributions from members		57.50	
Sale of Proceedings volumes		768.75	
Miscellaneous		395.58	3,020.85
Bank interest on special fund for Committee on Place of Science in Education			24.73
Kansas City Meeting:			
Local contributions		2,856.59	
Validation fees		570.50	
Sale of programs		16.50	
Exhibition:			
Receipts from exhibitors		1,315.40	
Donations		500.00	3,443.59
			$86,327.30

Cr.

By subscriptions to official journal			$40,869.42
By Division, Local Branch, and Academy allowances:			
Division		1,727.00	
State College (Pa.) Local Branch		10.50	
Affiliated state academies		1,032.00	2,769.50
By expenses, Washington office:			
Salaries		$11,172.00	
Office and addressograph supplies		176.86	
Printing and stationery		611.46	
Telephone and telegraph		200.06	
Postage, correspondence and billing		1,038.02	
Exchange		19.10	
Express, freight, and drayage		80.20	
Notary fees		1.75	
Miscellaneous		296.79	
Apparatus and machines		431.85	14,028.09
By Circularization			1,025.87
By expenditures on publication of Proceedings Volume (December, 1925)			6,203.27
By Miscellaneous expenses:			
Life-membership fees to treasurer		2,100.00	
Contribution to National Conference on Outdoor Recreation		100.00	
Contribution to American Institute of Sacred Literature		60.00	

[2] Cash to be reimbursed later from Endowment Fund.

Annual meeting (Kansas City):			
Preliminary announcement	$ 421.98		
Program	1,260.00		
Report	772.68		
Exhibition	1,815.40		
General expenses:			
At Washington office	550.86		
At Kansas City	2,113.59	6,934.51	
Philadelphia exhibition		250.00	
Travel expenses		2,384.42	
Section expenses		604.21	12,433.14
By expenditures, Committee on Place of Science in Education			123.40
			$77,452.69
By new balance:			
Publication fund[3]		1,482.41	
Special fund for Committee on Place of Science in Education[3]		848.93	
Emergency fund[3]		5,000.00	
Unexpended balance of appropriation for Philadelphia exhibition[3]		250.00	
Available for general purposes[3]		1,293.27	8,874.61
			$86,327.30

AUDITOR'S REPORT

Mr. Burton E. Livingston, Permanent Secretary,
American Association for the Advancement of Science,
Smithsonian Institution,
Washington, D. C.

Dear Sir:

Having been appointed Auditor for the Association for the year 1926, I have employed Mr. W. R. Gallaher, an accountant at the Interstate Commerce Commission, to go over the accounts of the Permanent Secretary for the year ending October 1, 1926. He makes the following report:

This is to certify that I have examined the receipts and disbursements in currency, checks, etc., of the Permanent Secretary's office of the American Association for the Advancement of Science for the 12 months ending September 30, 1926, and have found the records correctly kept. Proper vouchers were shown for all disbursements.

(Signed) W. R. GALLAHER,
Accountant

I have reason to believe that Mr. Gallaher is an experienced and reliable accountant and that the above statement is a dependable report on the state of the accounts which were audited.

Very truly yours,

(Signed) ROBERT B. SOSMAN,
Auditor.

November 30, 1926.
RBS/J

[3] All these funds are in the Savings Department of the Federal-American National Bank.

GRANTS FOR RESEARCH

The Committee on Grants for Research has made allotments for 1927, from funds appropriated by the council for this purpose. The list of grants is given below. Every application for a grant was considered very carefully by the committee on grants and the allotments are the result of a vote of the committee. In cases of unsuccessful applications the adverse decision is not to be considered as implying adverse criticism of the proposed studies in their respective fields, but denotes simply that the projects were regarded as not suitable for grants from the association at this time. It is, in general, undesirable that grants from the association be continued from year to year for the same project, and some applications for continuation were disapproved for this reason. One of the basic aims of the association in making grants in aid of research is to help in the undertaking of new projects that are not yet in position to secure support elsewhere. After a project has been started it often becomes possible to attract support from sources that would not have been interested at the beginning.

The attention of members of the association should be called to the fact that the council's appropriations for individual grants have not been entirely used in recent years, due to the small number of suitable applications received by the committee on grants. There were only fifteen applications in 1926.

Applications for grants in aid of research should be made by members to the permanent secretary (who acts also as secretary of the committee on grants) at any time during the year, preferably before October 1 but before December 1 at latest. These should be supported by letters from workers in science other than the applicant, who should be asked to write directly to the permanent secretary. Letters may be addressed to members of the committee on grants, but copies should be sent to the permanent secretary's office in every case. Consideration of the applications proceeds as they are received and all are brought together in December, for final consideration and for the vote on allotments by the committee on grants. Allotments are not made at any other time. Grants become available shortly after the close of the annual meeting. They may be drawn upon as funds are required for the research project, but they should generally be withdrawn before October 1; otherwise they automatically revert to the treasury on that date. An undisbursed grant for any year may, however, be carried over to the next following year on special application from the grantee and with the approval of the committee on grants, if such application is received by the permanent secretary's office by September 15.

Attention should be called to the requirement that grantees are each to send in a report on the progress

of the work for which the grant was made, these reports being due each year by October 1. Such reports should be continued from year to year till the grant has been used up, and there should be a final report showing where the results of the research in question have been published. Reprints of scientific articles including such results should be sent in also.

The association desires that the very limited funds available for individual grants for research shall be used in the most efficient ways. Members who have research projects that require small additional financial support should not hesitate to make application for grants. Grants are generally of not more than five hundred dollars, usually of smaller sums.

GRANTS FOR RESEARCH, 1927

Approved by the Committee on Grants

Jakob Kunz, University of Illinois, Urbana, Ill. For assistance in measurements of the rate of change of magnetic flux in homogeneous fields $200

William H. Cole, Clark University, Worcester, Mass. For studies on application of the pyridine test 150

J. G. Frayne, Antioch College, Yellow Springs, Ohio. For studies on stages in the excitation of the arc spectrum of lead 300

S. O. Mast, Johns Hopkins University, Baltimore, Md. For studies on the influence of chemicals on structure, movement and responses in Amoeba 300

Henry B. Collins, Jr., U. S. National Museum, Washington, D. C. For archeological investigations on ancient village sites of the main Bering Sea islands 350

Knight Dunlap, Johns Hopkins University, Baltimore, Md. For studying mouth and eye muscles in emotion 300

Bruce Fink, Miami University, Oxford, Ohio. For research on lichens and preparation of a manual of lichens of the United States 300

Ann Morgan, Mt. Holyoke College, South Hadley, Mass. For investigation and study of the blood by means of supravital technique 150

OFFICERS ELECTED AT PHILADELPHIA

President

Arthur A. Noyes, California Institute of Technology, Pasadena, Calif.

The Vice-Presidents

Section A (Mathematics), Dunham Jackson, professor of mathematics, University of Minnesota, Minneapolis, Minn.

Section B (Physics), A. H. Compton, professor of physics, University of Chicago, Chicago, Ill.

Section C (Chemistry), Roger Adams, professor of organic chemistry, University of Illinois, Urbana, Ill.

Section D (Astronomy), Walter S. Adams, director of Mt. Wilson Observatory, Pasadena, Calif.

Section E (Geology and Geography), Charles Schuchert, professor of paleontology and emeritus professor of historical geology, Yale University, New Haven, Conn.

Section F (Zoological Sciences), C. E. McClung, professor of zoology and director of the Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa.

Section G (Botanical Sciences), William Crocker, director of the Boyce Thompson Institute for Plant Research, Yonkers, N. Y.

Section H (Anthropology), R. J. Terry, professor of anatomy, Washington University, St. Louis, Mo.

Section I (Psychology), Knight Dunlap, professor of experimental psychology, Johns Hopkins University, Baltimore, Md.

Section K (Social and Economic Sciences), W. S. Leathers, professor of preventive medicine, Vanderbilt University, Nashville, Tenn.

Section L (Historical and Philological Sciences), Harry Elmer Barnes, professor of historical sociology, Smith College, Northampton, Mass.

Section M (Engineering), A. N. Talbot, professor of municipal and sanitary engineering, in charge of theoretical and applied mechanics, University of Illinois, Urbana, Ill.

Section N (Medical Sciences), G. Canby Robinson, professor and dean of the School of Medicine, Vanderbilt University, Nashville, Tenn.

Section O (Agriculture), L. E. Call, agronomist, Kansas Experiment Station, and professor of agronomy, Kansas State Agricultural College, Manhattan, Kans.

Section Q (Education), Arthur I. Gates, professor of education, Teachers College, Columbia University, New York, N. Y.

Secretary of Section H (Anthropology)

Fay Cooper Cole, associate professor of anthropology, University of Chicago, Chicago, Ill.

Elected Members of the Council, for 4-Year Term

L. E. Dickson, University of Chicago, Chicago, Ill.

David White, U. S. Geological Survey, Washington, D. C.

Members of the Executive Committee, for 4-Year Term

J. McKeen Cattell, Garrison-on-Hudson, N. Y.

Henry B. Ward, University of Illinois, Urbana, Ill.

Members of the Committee on Grants for Research for 4-Year Term

W. Lash Miller (for Chemistry), 8 Hawthorne Ave., Toronto, Canada.

Oswald Veblen (for Mathematics), Princeton University, Princeton, N. J.

THE PRESIDENT-ELECT

Arthur A. Noyes, the newly elected president of the American Association for the Advancement of Science, was born at Newburyport, Mass., on September 13, 1866, being the son of Amos and Anna Page (Andrews) Noyes. His collegiate work was done in the Massachusetts Institute of Technology, from which he was graduated with the degree of S.B. in 1886 and with the degree of S.M. in 1887. He was assistant in

analytical chemistry in his alma mater in 1887–88 and then went to Leipzig, where he studied with Wilhelm Ostwald. He received the Ph.D. degree from the University of Leipzig in 1890.

From the Leipzig laboratories Dr. Noyes returned to America with great enthusiasm for the new science of physical chemistry, which was just coming into being in Europe, mainly through the great work of Ostwald. In the Massachusetts Institute of Technology he was instructor in organic chemistry from 1892 to 1894, assistant and associate professor of theoretical chemistry from 1894 to 1899 and became professor of theoretical chemistry in 1899, holding that position till 1919, when he went to his present post at the California Institute of Technology.

After his return from Europe Dr. Noyes gathered about him at the Massachusetts Institute a group of earnest research workers, and it was the work of these men that, under his leadership, led to the foundation of physical chemistry in America. Noyes is called the father of American physical chemistry. He and his coworkers rapidly developed an accuracy and precision in methods that far surpassed those of the European workers in the new science at that time. The application of the law of mass action to the theory of solutions and to all phases of chemistry is one of his greatest contributions. Many eminent chemists who received early guidance and inspiration from Dr. Noyes call him the most successful American teacher of chemistry. He has always won the devotion of his students and colleagues, not only by his able and brilliant leadership but also by his unselfishness in aiding and advancing those who have been so fortunate as to work with him.

The new president of the association was director of the Research Laboratory of Physical Chemistry in the Massachusetts Institute from 1903 to 1907 and from 1909 to 1919, being acting president of the institute from 1907 to 1909. The great importance of his influence in American chemistry may be indicated by the attainments of men who worked with him as students and colleagues in his long and influential period at the Massachusetts Institute—such men as W. R. Whitney, Robert B. Sosman, E. W. Washburn, W. C. Bray, Richard C. Tolman, Charles A. Kraus, Duncan A. MacInnes, Frederick G. Keyes, G. N. Lewis, W. K. Lewis, W. D. Harkins, Walter A. Patrick. In 1913, Dr. Noyes took up the work of organizing chemical research at the newly founded California Institute of Technology and he has devoted all his time since 1920 to that institute, where he is professor of chemistry and director of the Gates Chemical Laboratory. He has made that laboratory one of the most prominent of the many important centers of chemical research in America.

Dr. Noyes was one of the original members of the National Research Council when it was organized in 1916 and his work in connection with the council may be considered as of an importance to American science paramount to his influence as an investigator and educator. His clear thought and advice have played an outstanding part in shaping the general policies and character of the Research Council, of which he is still one of the most useful members. His official record in the council is highly significant: original member, 1916; original member, executive committee, 1916; member, committee on rules and procedure, 1916; chairman, committee on nitric acid, 1916; member, executive board, from the beginning of war organization to present; chairman, interim committee, 1918; acting chairman, National Research Council, 1918; member, committee on building plans, 1918 to present; member, organization committee, 1918; member, executive committee, division of chemistry and chemical technology, 1918; member, division of chemistry and chemical technology (from its permanent organization), 1919–23; member, executive committee of that division, 1919–20; member, committee on promotion of fellowship in physics and chemistry, 1919; member, research fellowship board, 1919–21; member, division of foreign relations, representing the American Academy of Arts and Sciences, 1919–21.

The research contributions of Noyes may be briefly and inadequately summarized under the three following headings:

(1) Development of a system of qualitative analysis for the rare elements, based on studies extending over thirty years, with the aid of many associates and assistants.

(2) Researches on the properties of solutions, with special reference to the ionic theory, also with the aid of many coworkers, involving about forty publications from 1890 to the present.

(3) Studies on the laws of chemical reaction rates, 1894–1900.

As has been said, Noyes has been extraordinarily influential as a teacher. Perhaps his farthest-reaching and most ramifying influence is felt to-day in the teaching methods and procedure in use in chemical laboratories and classrooms throughout North America and far beyond. These advances in method are presented in a group of text-books, some of which have appeared in many editions, some being issued with the collaboration of joint authors, and in numerous journal articles on scientific education. The most important of the books just mentioned are: "Qualitative Chemical Analysis," "A System of Qualitative Chemical Analysis for the Rare Elements," "Class Reactions and Identification of Organic Substances," "Chemical Principles" (a new problem-method of

presentation of physical chemistry, with emphasis on the few fundamental principles of the science) and "General Principles of Physical Science."

The president-elect has been a member of the American Association for the Advancement of Science since 1896, a fellow since 1897. He was secretary of Section C (Chemistry) for 1900, a member of the executive committee of the association from 1920 to 1923 and he had previously served for years as a member of the council and of the committee on policy, which, before the reorganization in December, 1919, corresponded to the present executive committee. He is now president of the Pacific Division of the association. He has received the following honorary degrees: LL.D., University of Maine, 1908, and Clark University, 1909; Sc.D., Harvard University, 1909, Yale University, 1913, and University of Pittsburgh, 1915. He is a member of the National Academy of Sciences, of the American Philosophical Society, of the American Chemical Society (president for 1904), of the Deutsche Chemische Gesellschaft and of the Bunsen Gesellschaft; he is a fellow of the American Academy of Arts and Sciences and an honorary fellow of the Royal Society of Edinburgh. He was awarded the Willard Gibbs Medal, of the American Chemical Society, in 1915. He has been a research associate of the Carnegie Institution of Washington from 1921 to the present. He edited the *Review of American Chemical Research* from 1895 to 1910 and was editor of the Proceedings of the National Academy of Sciences for 1915–16.

Dr. Noyes had been active and greatly influential in the development of the American Association for the Advancement of Science, of which he is now president. He is specially interested in the following three lines of work in which the association is engaged, these being stated in his own words:

> (1) In popularizing science, in creating better appreciation among the intelligent public of the spirit and methods of science and of the tremendous intellectual and practical importance of extending by research the bounds of knowledge. (2) In acting as an agency for the federation and broadening of scientific work, by bringing together (especially at the annual meetings) the various scientific societies and leading scientific men in different fields. (3) In directly encouraging and aiding research, as by the formulation and promotion of large projects of investigation and by assistance to and recognition of individual investigators. In the last of these lines the association shares the field with other scientific organizations. In the first two, however, it has somewhat unique opportunities, and I think its efforts should be specially directed toward the fuller realization of these opportunities.

The newly elected president's term extends to the end of the Nashville meeting next winter and, as retiring president, he is to deliver the most important address at the fifth New York meeting, the following year.—B. E. L.

THE PHILADELPHIA SESSIONS OF SECTIONS AND SOCIETIES

Brief reports from the secretaries of the association sections and from the secretaries of the societies that met with the association at Philadelphia have been brought together in the following pages, arranged according to the association sections. The permanent secretary is very grateful to the secretaries who sent the reports.

SECTION A (MATHEMATICS)

Vice-president and chairman, E. V. Huntington; *retiring vice-president,* W. H. Roever; *secretary,* R. C. Archibald, Brown University, Providence, R. I. With the section met the American Mathematical Society (*president,* G. D. Birkhoff; *secretary,* R. G. D. Richardson, Brown University, Providence, R. I.), and the Mathematical Association of America (*president,* D. Jackson; *secretary,* W. D. Cairns, Oberlin, Ohio).

(Report received from R. C. Archibald)

Section A held one joint session on Thursday morning with the affiliated organizations, the American Mathematical Society, and Mathematical Association of America. Professor Huntington presided and three papers were presented, the first by Professor Birkhoff, the retiring president of the society, the second by Professor Roever, the retiring chairman of Section A, and the third by Professor Murnaghan representing the Mathematical Association of America. The papers were all of a remarkably high standard of excellence, and for the first, "A Mathematical Critique of some Physical Theories," the $1,000 prize was awarded by the American Association for the Advancement of Science. This paper is to be published in full in the *Bulletin of the American Mathematical Society.* An abstract of the paper is as follows:

Geometry is the simplest branch of physics. The whole of ordinary Euclidean geometry can be regarded as the unfolding of a single law, namely, that embodied in the Pythagorean theorem. The physical significance of geometry lies in its application to the comparison of material bodies; in this way arises the concept of "space" attached to a reference body.—In classical physics "space" was taken as the container of particles, and rigid and elastic bodies. Illustrations were given to show that the ordinary laws of motion of classical physics are incomplete and lead to difficulties: for instance, if two equal elastic spheres

approach one another with higher than twice the disturbance velocity of the spheres, the motion can not continue to obey these laws after collision. It was shown, however, that the introduction of suitable repulsive forces in the case of a system of particles and a similar device for continuous matter avoided these difficulties—The equations of classical dynamics are usually given in "Hamiltonian form." The significance of this form was asserted to lie essentially in that the small disturbances from periodic motions were themselves periodic in character; this fact followed as a result of recent researches by Professor Birkhoff—In passing to electromagnetism and the appropriate space-time of the special theory of relativity, the existence of an underlying finite disturbance velocity (that of light) was emphasized as of the greatest significance. The motions of particles and material bodies were reconsidered, and it was found that the only mathematically satisfactory elastic body is the "perfect fluid" in which the disturbance velocity is equal to that of light, the pressure being proportional to the density and of enormous magnitude. However, the fundamental usefulness of the elastic body is as the carrier of electricity and it was explained why no conceivable law relating pressure and density can ever yield a stable proton or electron. To avoid all these difficulties Professor Birkhoff proposed the use of his particular type of elastic body and a new assumption that the electrical forces between the charges on one and the same proton or electron are interpenetrable. This point of view led him to the notion of "atomic potentials"—The space-time background of the general theory of relativity was next outlined. The vital rôle that the symmetry of the solar gravitational field plays was emphasized, as well as the fact that general relativity throws no light whatever on the structure of matter, being essentially a theory of empty space. It was found possible to adapt the ideas of the "perfect fluid" and of "atomic potentials" to the new space-time background.—In present-day physics the properties of atoms and electrons are of central importance. It is the experimental results of spectroscopy that have led to the quantum theory with its apparent discontinuities. Professor Birkhoff reviewed some of the central facts and concluded that the space-time background of the general theory of relativity seemed reasonably correct qualitatively, but that the way had not yet been found to account for the fundamental frequencies of vibrations of the atom such as are given in the Balmer formula. From the mathematical point of view, such frequencies call for a corresponding "wave equation." He referred briefly to the equation devised by Schrödinger, of so much interest to-day, and also to the wave equation embodying the theory outlined in his address. The interest of the latter would be purely mathematical, he said, unless it turned out to give the right fundamental frequencies.—In conclusion Professor Birkhoff affirmed that the rapid state of flux in physical speculation seems due to the fact that the laws in the atomic domain seem irreconcilable with the known statistical laws which can be directly verified. Perhaps, as many physicists think, the notions of space and time are inapplicable to the atom, and an altogether new approach must be devised. But he held this to be not established. He hoped that the mathematician would develop various types of model mathematical universes which might subsequently be of aid to the physicist.

In Professor Roever's address, on "The Weight Field of Force of the Earth," were considered certain statical and dynamical phenomena which take place in the weight field of force of the earth; *i.e.*, in the field of force which is the resultant of the earth's gravitational attraction and the centrifugal force due to the rotation of the earth. As examples of the dynamical phenomena he considered the deviation of a projectile from its initial azimuthal direction of projection, the rotation of cyclones, and the rotation of the plane of oscillation of the Foucault pendulum. Among the statical phenomena, he considered at some length the theory of the Eötvös torsion balance. By means of this balance the curvatures of the level surfaces and of the lines of force can be determined. Thus this balance renders great service in geology as well as in higher geodesy, since by its use not only a very accurate determination of a level surface is made possible, but also because it indicates the position of mineral deposits. He also illustrated by means of an apparatus the effect on the curvature of lines of force of the introduction of a new mass into a field of force. Incidentally, in the treatment of the plumb-bob locus, *i.e.*, in the locus of the bobs of all plumb-lines which have the same support, he explained the paradox of the conical pendulum, and he also gave optical interpretations to some terms in higher geodesy. All the results were rigorously deduced from fundamental laws of mechanics.

Professor Murnaghan's topic was "The Duty of Exposition, with Special Reference to the Cauchy-Heaviside Expansion Theorem." An abstract of the address is as follows:—Next only in importance to the discovery of new facts in mathematics is the duty of explaining in as clear and simple a manner as is possible results already known. This responsibility is assumed, of course, by writers of text-books, but it rests more particularly, perhaps, on the shoulders of the actual discoverers of mathematical truths. To point the moral, reference is made to two instances which have recently come to the speaker's attention,

where known results have escaped the attention of even interested experts through lack of a detailed exposition. The first instance is Steiner's problem as to the point of minimum distance-sum to four points in space; although the correct method of solution was indicated by Steiner almost one hundred years ago the indication was so brief that such a renowned geometer as Sturm treated the problem at length in *Crelle's Journal* as recently as 1913, and did not arrive at the correct solution. More important is the second instance which is the Heaviside Expansion Theorem which is of fundamental importance in the discussion of vibrational problems in dynamics and similar problems in the transmission of electric signals. A perfectly obvious extension of Cauchy's classical method for the determination of a particular integral of a linear non-homogeneous differential equation with constant coefficients gives the Heaviside expansion theorem. There is an element of poetic justice involved here; for although Heaviside was a genius whose work was of the most fundamental importance for the modern development of telephony he was extremely unorthodox in his mathematics and was continually railing at the mathematicians for not recognizing his work. The retort courteous would have been "Read your Cauchy," but far better than this retort for the progress of mathematical science would have been a clear and simple exposition of the theory. In conclusion, reference was made to the important work at present undertaken by the Mathematical Association of America in its series of expository works known as the Carus Monographs.

The American Mathematical Society held sessions for the presentation of sixty-five papers on Tuesday and Wednesday mornings and afternoons. There were 188 members in attendance, the largest number in the history of the society. A full report of the meeting, including abstracts of the papers, will appear in the *Bulletin of the American Mathematical Society*.—The Fourth Josiah Willard Gibbs Lecture, of the American Mathematical Society, on "Mathematics and the Biological Sciences," was delivered by H. B. Williams, of Columbia University. Professor E. S. Crawley was in the chair. This lecture will be published in the *Bulletin of the American Mathematical Society*. The American Mathematical Society elected Professor Virgil Snyder, of Cornell University, as president for 1927–28. Probably its most noteworthy action was the ratification of an agreement with the Johns Hopkins University, whereby the *American Journal of Mathematics* will be developed and enlarged, the majority of the editors being appointed by the society. Upon request, associate editors of *The Annals of Mathematics* were also appointed, three by the society and two by the Mathematical Association of America. Both the society and association voted also to collaborate with the History of Science Society in arranging for a program and exhibit in New York next spring, to commemorate the bicentenary of Sir Isaac Newton's death.

The Mathematical Association of America held its eleventh annual meeting on Thursday afternoon and Friday morning when eight papers were presented. Professor W. B. Ford, recently editor-in-chief of the association's official organ, *The American Mathematical Monthly*, was elected president for two years. W. H. Bussey was appointed the new editor-in-chief. The trustees considered possibilities for publishing the wonderful mathematical bibliography of Dr. Valentin, and it was voted that it was the sense of the trustees that the publication of this work in America would be very desirable if the necessary funds (about $60,000) were forthcoming.—On Wednesday a very successful dinner for the mathematicians was held at the Aldine Hotel. More than one hundred and seventy-five sat down at the tables, and Professor E. V. Huntington acted as presiding officer.—Several papers of interest to mathematicians were read before Section D, and the History of Science Society, which is related to Section L.

SECTION B (PHYSICS)

Vice-president and chairman, W. Duane; *retiring vice-president,* H. M. Randall; *secretary,* A. L. Hughes, Washington University, St. Louis, Mo. With Section B met the American Physical Society (*president,* Dayton C. Miller; *secretary,* Harold W. Webb, Columbia University, New York City), and the American Meteorological Society (*president,* C. F. Marvin; *secretary,* C. F. Brooks, Clark University, Worcester, Mass.).

(Reports received from A. L. Hughes and Charles F. Brooks)

Section B, in conjunction with its affiliated societies, held meetings on Tuesday, Wednesday, Thursday and Friday, December 28 to 31. It is estimated that over three hundred members and others attended. The address of the retiring vice-president, Professor H. M. Randall, of the University of Michigan, was given Tuesday afternoon on "Infra-Red Spectroscopy." After an interesting introduction describing the progress of investigation in this field during the last century, the speaker discussed in more detail the rapid advances made in the last twenty-five years. He referred to the various improvements in technique which have made possible a rapid accumulation of accurate data. The extraordinary usefulness of the quantum theory in correlating and interpreting much of these data was discussed at some length. The speaker

closed with a statement of the more pressing unsolved problems in this field of physics. Professor Randall's address will be published later in SCIENCE.—The address of the retiring vice-president was followed by a lecture by Professor W. F. G. Swann, of Yale University, on "The New Quantum Dynamics." Towards the end of 1925, a modified form of the quantum theory was suggested by Heisenberg and this was developed with great vigor by Heisenberg, Born and others. As this new form of the quantum theory is by far the most interesting and significant contribution to theoretical physics in recent years, Section B invited Professor Swann to give an address on the subject. He began with a brief résumé of the older form of the quantum theory and stressed the difficulties which it encountered in further developments along accepted lines. Having shown the need for modification in the older form, he indicated how the new quantum dynamics avoided the difficulties by beginning from a new starting point. Professor Swann also included at some length a discussion of the still newer modification of the quantum theory put forward by Schroedinger. The address was followed by a discussion to which Dr. Breit and Dr. Van Vleck contributed, and in which they showed how the new quantum dynamics led to a better agreement with certain experimental results than did the older form of the quantum theory.

The American Physical Society had a program occupying five half days, to which seventy-seven papers were contributed. To get through the program it was found necessary to run two sessions simultaneously on some days. The annual business meeting of the society was held on Wednesday morning, December 29, at which the results of the elections for new officers were made known. Professor K. T. Compton, of Princeton University, will be the new president, and Professor H. G. Gale, of the University of Chicago, will be the new vice-president. On Wednesday evening, December 29, the American Physical Society held a most successful dinner at the Hotel Bartram. The speakers included Professors D. C. Miller, W. F. Magie, M. I. Pupin, W. S. Franklin, W. Duane, W. F. G. Swann, W. J. Humphreys, W. E. Forsythe, G. B. Pegram and H. G. Gale. The program of the Physical Society was postponed on Thursday morning, December 30, to allow members to hear the address of Professor G. D. Birkhoff, president of the American Mathematical Society, on "A Mathematical Critique of Some Physical Theories."

The American Meteorological Society held a well-attended meeting, full of interest. The society joined the Association of American Geographers and Section E for its opening session on Greenland. Dr. W. H. Hobbs led this symposium with a general account of the first Greenland Expedition of the University of Michigan, and exhibited a large collection of photographs. Mr. S. P. Ferguson summarized the meteorological results, and Dr. W. E. Ekblaw spoke, from his personal experience during four years in northwest Greenland, on the local character of Greenland climatic data. The symposium closed with a discussion of Dr. Hobbs's theory of the glacial anticyclones, led by Dr. Charles F. Brooks. Several papers on cycles were presented; one on the Brückner cycle by Professor A. J. Henry, two on rainfall periods one and one sixth and two and one half years in length, by Dr. Dinsmore Alter, and one on historical events and the sunspot cycle. Dr. Alter's papers were the conclusion of seven years' statistical work on the subject. Professor C. F. Marvin's presidential address was on "Measurements of Solar Radiation and their Interpretation." Dr. C. G. Rossby presented an interesting application of Norwegian polar-front synoptic methods to some American weather maps. Mr. W. R. Gregg described the recent development of Weather Bureau helps for commercial aviation, pursuant to the Air Commerce Act.—The society's seventh year was shown by the secretary's and treasurer's reports to have been successful in a gain both in membership and in financial position. A $100 prize was offered for award at the end of 1927 from the Meisinger Aerological Research Fund for a meritorious contribution to aerology or aeronautical meteorology. The officers for the new year are: *Treasurer,* W. R. Gregg; *secretary,* C. F. Brooks; *councilors* (1927–1929), C. G. Abbot, E. H. Bowie, A. E. Douglass, J. Patterson and B. M. Varney.

SECTION C (CHEMISTRY)

Vice-president and chairman, Lauder W. Jones; *retiring vice-president,* H. P. Cady; *secretary,* Gerhard Dietrichson, Massachusetts Institute of Technology, Cambridge, Mass.

(Report received from Gerhard Dietrichson)

Section C held meetings on Monday and Tuesday and on Thursday. The papers given were all by speakers invited by the section committee. The program was made up of two joint sessions with other groups in the association and two half-day sessions of Section C itself. On Tuesday morning Section C joined with Section N in a symposium on "Growth and Development in Health and Disease." An account of this session will be found in the report of Section N. Thursday forenoon there was a joint session with the American Astronomical Society, the subject for discussion being "Cosmic Chemistry." Professor Henry P. Russell spoke first on "The Chemistry of the Stars." He brought out in a very interesting man-

ner the molecular, atomic and ionic relations of the elements in stars at different temperatures, as disclosed by a study of their spectra. He also explained that the successive ionizations and dissociations of stellar chemistry are apparently governed by the same equilibrium laws as are familiar to the chemist in his study of chemical reactions. Dr. W. J. Humphreys, general secretary of the association, followed with a discussion of the chemistry of the atmosphere. He spoke first about possible explanations as to how the earth came to have an atmosphere and then described the distribution of the various constituents. Of particular interest in this connection was the estimate as to the amount of ozone, especially in the upper regions, and the important part that it plays in shutting off the short-wave radiations from the sun. Dr. George P. Merrill concluded with an account of the composition of meteorites. He called attention to the fact that the meteorites contain oxidizable materials that are not oxidized. It is also of interest to note that most of the elements that are found belong in the third and fourth series of the Periodic System.—The retiring vice-president for Section C, Professor H. P. Cady, delivered an address on Tuesday afternoon on "The Chemistry of the Future." He reminded his audience that the fundamental facts of chemistry will remain the same, say fifty years from now, as they are to-day. But the tremendous increase in knowledge will make the mastery of the science difficult. This situation can be met in part by improved methods of instruction and also by longer periods of preparation. The latter may become practicable through increased span of human life and activity. Professor Cady also presented some speculations as to the possibility of simplifying chemical generalizations. He predicted that, after the atomic theory has become complex enough to take care of the Bohr-Sommerfeld-Lewis-Langmuir atom, as well as the facts which are so rapidly accumulating, then some young man will replace it with a much simpler theory. At this same session Mr. F. Austin Lidbury read a paper on the function of Section C. This was followed by a discussion. One of the ideas brought out very clearly was that the association meetings offer an excellent opportunity for the consideration of border-line subjects. This was strikingly illustrated at the Philadelphia meeting by the number in attendance and by the interest manifested in the joint sessions that Section C held with Section N and with the American Astronomical Society.

The speakers for the remaining session were Dr. James A. Beattie and Dr. S. E. Sheppard. In speaking about the equations of state of gases, Dr. Beattie called attention to their importance in thermodynamic calculations and in gas thermometry. He pointed out that such equations must fulfil three conditions: *viz.*, they must fit the data, especially as to trends; they must be easy to differentiate and integrate in terms of pressure, volume and temperature, and the constants must be determinable from the data. After reviewing various equations of state, Dr. Beattie concluded with a presentation of recent work carried out at the Massachusetts Institute of Technology. Dr. Sheppard discussed the nature of photographic as distinguished from photochemical sensitivity. He presented the results of an extensive study of the process of photographic development, especially with reference to the effect on the individual grains in the plate. From the photographic effects obtained with different gelatins, investigation led to the isolation of a sensitizing material apparently related to cholesterol. This in turn led to a search for other substances giving similar products.

SECTION D (ASTRONOMY)

Vice-president and chairman, R. G. Aitken; *retiring vice-president,* A. E. Douglass; *secretary,* Philip Fox, Dearborn Observatory, Evanston, Ill. With the section met the American Astronomical Society (*president,* G. C. Comstock; *secretary,* Joel Stebbins, Washburn Observatory, Madison, Wisconsin).

(*Reports received from Philip Fox and Joel Stebbins*)

Section D held a successful meeting in conjunction with The American Astronomical Society. Over seventy astronomers were in attendance. The first day was left free for visits to other sections and societies. Many, of course, took the natural road to mathematics and physics, but some got as far afield as anthropology and biology, while several separate parties made a trip of inspection to the new Delaware River bridge. —The program listed thirty papers which covered a wide range, the largest number being in the field of stellar spectroscopy, with almost an equal number of titles on: stellar parallax; planetary observations, including radiation; distribution of stars; fundamental astronomy, etc. The astronomers have been increasingly successful in keeping their communications short, with plenty of discussion. The address of A. E. Douglass, retiring vice-president for Section D, presented a summary of his extensive search for relations between tree growth and solar activity recorded in sun-spot numbers. This address will be published in full in SCIENCE. Charles Lane Poor, in a paper on "The Relativity Deflection of Light," challenged some of the fundamental results of the theory of relativity. His investigation indicates that there should be a deflection of light at the limb of the sun of 1.10 rather than of 1.70 as predicted by Einstein. Another matter of controversial nature has been lifted definitely out of that class by the results of Coblentz

and Lampland, on the "Measurements of the Radiation from the Planet Mars at the Lowell Observatory in 1926." The noonday temperature in the equatorial region of Mars, as indicated by their observations, are 20°–30° Centigrade, a temperature certainly high enough to support life as we know it. A paper by E. C. Slipher gave conclusive evidence of clouds in the Martian atmosphere. Among other important papers should be noted "Absolute Magnitudes and Parallaxes of 419 M-Type Stars," by Adams, Joy and Humason; "On the Effect of Distance upon the Intensities of Detached Calcium Lines," by Struve; an interesting application of the photoelectric cell to the light variations of the satellites of Jupiter, by Stebbins. These papers will be more fully reported in *Popular Astronomy*.—On Tuesday afternoon Section D met with Section B, to hear the address of Retiring Vice-president H. M. Randall and the address on "The New Quantum Dynamics," by W. F. G. Swann. On Thursday morning there was a joint session with Section C, the general subject being "Cosmic Chemistry," with addresses on "The Chemistry of the Stars," by Henry Norris Russell; "The Atmosphere, Bottom to Top," by W. J. Humphreys; "The Present Conditions of Knowledge on the Composition of Meteorites," by George P. Merrill. The paper on the chemistry of the stars probably impressed the chemists with how much chemistry some astronomers know, but it impressed the astronomers with how much more chemistry they will have to learn in order to understand what is going on in their own field. The earth's atmosphere was shown to be an advantage or a nuisance to astronomers, depending upon the point of view; and, as for meteorites, it is well that astronomers occasionally take interest in the only heavenly bodies that are readily accessible.—The Astronomical Society adjourned in a body to attend the Wednesday afternoon session of the American Association, where Dr. Heber D. Curtis gave an address on "The Unity of the Universe." On Wednesday evening there was a pleasant informal dinner of the astronomers at the Hotel Walton, with Dr. Shapley presiding. On Thursday morning Professor Barton, of the Flower Observatory, conducted a party across the Delaware River Bridge, to view that great engineering triumph.

After adjournment on the last day, a bus load made the round from the Flower Observatory of the University of Pennsylvania through Haverford and Bryn Mawr to the Sproul Observatory of Swarthmore College.—The astronomers are deeply indebted to Professor S. G. Barton, of the University of Pennsylvania, and to Professor John Pitman, of Swarthmore College, for many features that contributed largely to the success of the meetings. The next meeting of the Astronomical Society will be at Madison, Wisconsin, in September, 1927, near the time when the mathematicians will also be meeting there.

SECTION E (GEOLOGY AND GEOGRAPHY)

Vice-president and chairman, G. H. Ashley; *retiring vice-president,* R. A. Daly; *secretary,* G. R. Mansfield, U. S. Geological Survey, Washington, D. C. With the section met the Association of American Geographers (*president,* J. Paul Goode; *secretary,* Charles C. Colby, University of Chicago), and the National Council of Geography Teachers (*president,* Erna Grassmuck; *secretary,* George J. Miller, State Teachers' College, Mankato, Minn.), also the American Alpine Club.

(Reports received from G. R. Mansfield, Charles C. Colby and George J. Miller)

The Philadelphia meeting of Section E was interesting and successful, though the attendance was not so large as at the Kansas City meeting. Joint sessions were held with the Association of American Geographers on Tuesday morning and afternoon and a joint dinner for the two organizations was provided on Wednesday evening. Other joint sessions were arranged with the Eastern Section of the Seismological Society of America on Wednesday afternoon and with the American Meteorological Society and the Association of American Geographers on Thursday morning. Independent sessions of Section E were held on Wednesday morning and on Thursday afternoon. Seventeen papers were presented under the auspices of the section and five were read by title. Professor R. A. Daly, retiring vice-president for the section, was detained by illness, much to the regret of all. He had intended to speak on "Dynamical Geology since 1900." Dr. J. Paul Goode, retiring president for the Association of American Geographers, read his interesting and informative address at the joint dinner, and Dr. G. H. Ashley, chairman of Section E, presided. Professor William North Rice was called upon for extempore remarks and responded in his usual felicitous way.—Of the contributions presented, six were physiographic, five related to earth structure and four to earthquakes. Among the interesting features discussed at the Wednesday morning session three may be selected for special mention: (1) That there has been a long succession of climatic changes in Mongolia is clearly shown by the stratigraphy, as described by F. K. Morris; (2) the studies of Frank Leverett, as reported by Ashley, indicate the association of gravels with the so-called Harrisburg peneplain, 500 to 560 feet above sea level, which suggest a Pleistocene age for this feature and a much greater extension of erosional activity in the Pleisto-

cene than has hitherto been supposed; (3) a study of big springs, as described by Meinzer, shows that underground drainage tends to develop "underground peneplanation." At the Wednesday afternoon session Ehrenfeld pointed out that the Philadelphia area possesses the mechanism requisite for an earthquake whenever the necessary energy is available. Macelwane and Repetti gave concise and clear-cut descriptions of two California earthquakes and Neumann summarized recent studies of the velocities of surface earthquake waves in North America. The Thursday afternoon session dealt chiefly with structural studies in Pennsylvania. Miss Bascom exhibited a model, prepared by Ward's Natural Science Establishment under her direction, which represented an area eleven miles wide and fifty-five miles long extending across the Piedmont in Delaware and Pennsylvania, and on which the areal and structural geology and various physiographic features were very clearly depicted. Stose presented a tectonic map of Pennsylvania and discussed its intricate features and, in a second paper, suggested that the Schooley peneplain in the Piedmont is the equivalent of the Kittatinny peneplain in the Appalachian Mountains and valley ridges, and that their discrepancy in altitude, about four hundred feet, is due to post-Cretaceous faulting. At each of the sessions there was much discussion.

The Association of American Geographers held its twenty-third annual meeting at Philadelphia, including four regular half-day sessions, a luncheon as guests of the Geographical Society of Philadelphia, a field excursion to Chester Valley, an evening round table, a dinner jointly with Section E, and a symposium on Greenland held in connection with the American Meteorological Society. The meeting was characterized by the general excellence of the papers, by active and discerning discussion, and by a large attendance. The program demonstrated that highly significant work is being done in the development of cartographic technique and in the solution of cartographic problems. Seven papers dealt directly with maps and a number of others were illustrated with maps new in both material and method. In his presidential address J. Paul Goode spoke on "The Map as a Record of Progress in Geography," tracing the development of map-making and showing how discoveries of new lands and of new facts have stimulated cartographic work. He showed that new uses for maps have led to new processes and new forms of projection. The round-table discussion of "Pioneer Belts," led by Isaiah Bowman, was an outstanding feature of the meeting. The discussion was in the nature of a report to the association of the work of a committee of its members in the division of geology and geography of the National Research Council. Under a general administrative title of "Pioneer Belts," this committee urges a scientific study of the settlement of America by geographers and others. (See *Geogr. Rev.*, Oct., 1926, p. 647.) O. E. Baker briefly outlined a program for a study on the northern frontier of the Prairie Provinces of Canada. The discussion centered on the geographic objectives of a study of pioneer belts, and upon the probable practical results of such investigations.—Historical geography was represented by two papers of unusual interest. Ellen Churchill Semple, in a study of "The Templed Promontories of the Ancient Mediterranean," gave the results of a prolonged investigation, showing that, of the numerous promontories of the Mediterranean coast, a large number were crowned with temples or altars in ancient times, that a still larger number were sacred to deities whose names they bore, patron gods of the ancient seamen, and that these same promontories in the eastern Mediterranean Basin are crowned at the present time with shrines of chapels to Saint Nicholas, patron saint of sailors in the Greek Catholic hagiology, while many of them in the western basin are marked with shrines or churches to the Virgin Mary, the *Stella Maris* of the Roman Catholic world. Miss Semple has mapped the distribution of the ancient temples and has called attention to their relation to prevailing winds in the season of navigation and to ancient trade routes. The second paper in this group was by Edward L. Stevenson, on "Geographical Activities of the Casa de la Contratacion." Mr. Stevenson emphasized the circumstances leading to the establishment of the Casa de la Contratacion or Indian House, in Seville, and the special importance attaching to its geographical activities. Important progress in geographical field studies was demonstrated by several papers. Particularly significant is a system, devised by V. C. Finch, of mapping detailed geographic interrelationships. Relationship is mapped, rather than individual features of either the cultural or natural landscape. The areal extent of a given relationship can be measured and recorded. D. S. Whittlesley introduced a series of devices for securing and tabulating field data, and K. C. McMurry reported on progress being made by the Michigan Land Economic Survey, which is making a complete inventory of the resources of several counties in Northern Michigan. For many years geographers have struggled with the problem of adapting census statistics of manufacturing industries to geographic uses. In this connection Robert S. Platt presented a highly original classification of manufacturing industries, using those of Porto Rico as illustration.

The annual meeting of the Association of American Geographers for 1927 will be held at the George Pea-

body College for Teachers, Nashville, Tennessee, at the time of the meeting of the American Association for the Advancement of Science. The officers for 1927 are: *President,* M. R. Campbell; *vice-president,* Charles C. Adams; *secretary,* Chas. C. Colby, University of Chicago; *treasurer,* V. C. Finch; *councillors,* D. H. Davis, Philip S. Smith, Oliver E. Baker, Ray H. Whitbeck and J. Paul Goode.

The National Council of Geography Teachers held one of the largest and most successful meetings in its history. The most outstanding features were: (1) Provision in the program for clinics in which demonstrations of educational experiments were made, these being analyzed by specialists in the fields of geography and of education. (2) The establishment of a research bureau in educational geography, in the office of the council secretary, which is to act as a cooperative clearing-house to acquaint workers with investigations that have ben made and are now in progress. (3) The appointment of a permanent educational relations committee, to act as a liaison committee with other organizations; Miss Erna Grassmuck, chairman. (4) The formulation of suggestive units of study for secondary schools, inclusive of the junior high school. A report on this work will probably be published in the spring. (5) The formulation of suggestive units of study in professionalized subject matter for teacher-training institutions. (6) Decision to cooperate with the World Federation of Education Associations at its Toronto meeting next August.—Among the many strong papers presented, special mention may be made of "Problems demanding Immediate Attention," by Erna Grassmuck, president of the council; "The Contribution of Geography to Vocabulary," by A. Duncan Yocum; "Some Essentials in building a Geography Course of Study," by Florence E. Bamberger; "Geography Lessons as Means of Training for Wholesome Utilization of Leisure," by Walter Lefferts; "Contribution of Geography in Senior High School Grades," by Albert P. Brigham, and "Modern Concepts of Geography," by J. Russell Smith. These papers will be published in the *Journal of Geography.*

Dr. Robert G. Buzzard was elected president of the National Council, and George J. Miller (State Teachers College, Mankato, Minn.) was elected secretary. The next annual meeting is to be in conjunction with the American Association for the Advancement of Science, at Nashville, in December, 1927. The meeting will be held in the geography department of George Peabody College for Teachers.

The American Alpine Club met with the American Association at Philadelphia, but no report of its meeting has been received.

SECTION F (ZOOLOGICAL SCIENCES)

Vice-president and chairman, Winterton C. Curtis; *retiring vice-president,* H. S. Jennings; *secretary,* Geo. T. Hargitt, Lyman Hall, Syracuse University, Syracuse, N. Y. With the section met the American Society of Zoologists (*president,* S. O. Mast; *secretary,* D. E. Minnich, University of Minnesota, Minneapolis, Minn.), the Entomological Society of America (*president,* W. A. Riley; *secretary,* J. J. Davis, Purdue University, Lafayette, Ind.), the American Association of Economic Entomologists (*president,* Arthur Gibson; *secretary,* C. W. Collins, Melrose Highlands, Mass.), and the American Society of Parasitologists (*president,* C. W. Stiles; *secretary,* W. W. Cort, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.).

(Reports received from Geo. T. Hargitt, D. E. Minnich, J. J. Davis, C. W. Collins and W. W. Cort)

The zoological part of the Philadelphia meeting was in the hands of the several special societies. Professor Herbert S. Jennings, of the Johns Hopkins University, gave the address of the retiring vice-president for Section F, entitled, "Emergent Evolution," on the evening of Tuesday, December 28. This followed the annual zoologists' dinner. The audience, of 256 persons, taxed the seating capacity of the banquet room of the roof garden of the Hotel Walton. Dr. Jennings keenly analyzed the various mechanistic theories, pointing out their merits as well as their difficulties, as expressions of the present biological point of view. Then followed a clear discussion of the meaning of emergent evolution and of the speaker's reasons for the acceptance of this point of view in biological work. The address has been published in SCIENCE (January 14).

The American Society of Zoologists held sessions for the formal reading of papers on Monday, Tuesday and Wednesday mornings. Forty papers were read at these sessions, exclusive of a joint program with the Ecological Society of America. These were distributed as follows: General and comparative physiology, 20; comparative anatomy, 3; cytology, 6; protozoology, 5; embryology, 4; and miscellaneous, 2. The sessions were well attended, the attendance frequently running well over one hundred. A new feature of the program this year, which was especially emphasized, was the informal presentation of papers in the laboratory by demonstration or exhibit. Forty-two papers were scheduled for this form of presentation, distributed as follows: general and comparative physiology, 16; comparative anatomy, 3; cytology, 13; embryology, 3; ecology, 1; parasitology, 3, and miscellaneous, 3. Monday afternoon and all Tuesday afternoon, except for a short business

session, were reserved for this portion of the program, which proved to be a most enjoyable feature as the crowded laboratories attested. On Monday evening a large group attended the Biological Smoker, which was held in Weightman Hall. The program of the American Society of Zoologists closed at noon on Wednesday.

The Entomological Society of America held its twenty-first annual meeting December 28 and 29. Twenty-six papers, representing every field of entomology, were included on the program and all but four were read. In addition, one afternoon was devoted to a symposium on "Needed Lines of Investigation in American Entomology," the various phases of the subject being discussed by E. D. Ball, S. A. Rohwer, E. M. Walker, P. S. Welch, R. W. Doane, W. C. Allee, C. H. Kennedy, L. O. Howard, E. O. Essig, W. P. Flint and E. F. Phillips. The public annual address was given by Professor Geo. H. F. Nuttall, director of the Molteno Institute, of Cambridge, England, on the subject, "Insect Parasites of Man." The meetings were largely attended, varying from 65 to 250, averaging 133 for each of the five sessions. Seven exhibits, including a noteworthy exhibit on the Japanese beetle, were made by members of the society.—Officers for the coming year were elected as follows: *President,* F. E. Lutz; *first vice-president,* W. E. Hinds; *second vice-president,* E. P. Van Duzee; *secretary-treasurer,* J. J. Davis, Purdue University, Lafayette, Ind.

The American Association of Economic Entomologists opened its thirty-ninth annual meeting Tuesday morning, which continued to Saturday noon. The sessions were well attended, with about three hundred members and visitors present.—The section of plant quarantine and inspection (*chairman,* L. A. Strong; *secretary,* W. B. Wood, Washington, D. C.) held a session throughout Tuesday. C. L. Marlatt, chairman of the Federal Horticultural Board, spoke on the "Effect of the Supreme Court Decision of March 1, 1926, in the Case of the Oregon-Washington Railroad and Navigation Company *vs.* the State of Washington, on the Basic Quarantine Laws of the Various States." The discussion was continued by several members. "Inspection of Vehicular Traffic in the Enforcement of Plant Quarantines" was treated at length by C. W. Stockwell, with special reference to the Japanese beetle quarantine, and by L. H. Worthley, with reference to the European corn borer. A paper on "The Desirability of discontinuing the Licensing and Bonding of Nurserymen" was presented by C. H. Hadley and the "Results of Three Years' Experience in the Control of Mosaic of Red Raspberries in Nurseries" was presented by A. G. Ruggles. The chairman of this section for 1927 is J. H. Montgomery, and W. B. Wood continues as secretary.

The section of apiculture (*chairman,* J. I. Hambleton; *secretary,* G. M. Bentley, Knoxville, Tenn.) held an interesting session Wednesday afternoon, continued in the evening. Papers on "The Five-Year Brood Record of a Single Queen," by W. J. Nolan; "Waxworm Fumigation Experiments," by F. B. Paddock; "Federal Honey Grading Rules," by E. L. Sechrist, and "The Fertilization and Hibernation of Queen Bumblebees under Controlled Conditions," by T. H. Frison, were of special interest. The chairman gave an interesting paper on "Certain Phases of Apicultural Research in the United States." A most interesting paper was given in the evening by E. F. Phillips, on "Some Things I heard and saw while visiting European Bee Keepers and Their Societies in the Summer of 1926." Two features of the program of this section were a demonstration on artificial ensemination of queen bees, by Mr. Lloyd R. Watson, and a paper on "The Relative Sensitivity of Honey Bees to Light of Different Wave Lengths," by Lloyd M. Bertholf. The demonstration by Mr. Watson was very striking and was the first ever made in public on artificial ensemination of queen bees. The chairman of this section for 1927 is F. E. Millen, and G. M. Bentley (Knoxville, Tenn.) continues as secretary.

The program of the main association opened Wednesday morning with a business session, with Dr. Arthur Gibson as president and C. W. Collins as secretary. Reports of the various committees were read and action was taken, these being followed by the address of the president, entitled "International Entomology—Retrospective and Prospective." President Gibson discussed at length the founding and drawing up of the constitution of this association by James Fletcher, deceased, and L. O. Howard, in 1889, enumerated the accomplishments of the organization, and emphasized the cooperation that exists between the Canadian government and those for the United States and the various states. Eighty-four papers were listed on the program for the main association. Among the most striking were: "Some High Lights in the History of the Development of Entomology in California," by E. O. Essig; "Hot Water Bulb Sterilizers," by C. A. Weigel; "New Control Measures for the Squash-Vine Borer," by C. R. Cleveland; "Biological Factors in the Control of the Celery Leaf-Tyer," by E. D. Ball and others; "Baits More Attractive to the Oriental Peach Moth than 'Blackstrap' Molasses," by Alvah Peterson; "Experiments in Control of the Rose Chafer," by J. R. Eyer and others; "Arsenical Content of Sprayed Apples," by Albert Hartzell and others; "Cyanide Dust Fumiga-

tion," by H. J. Quayle; and "Termites modify Building Codes," by T. E. Snyder. Interesting papers were also presented on "Airplane Dusting for Gipsy Moth Control," "Airplane Dusting for Control of Hemlock Spanworm and Airplane Dusting of Sugar Cane." There was an interesting group of papers on the various phases of the Japanese beetle control, including parasites, attraction, spraying and methods of treatment of soil.—On the night of December 30 the entomologists held a dinner in the roof garden of the Hotel Walton, attended by 231 members and guests. The details were planned by the members of the Japanese Beetle Laboratory and a very unique entertainment arranged. Dr. W. E. Britton acted as toastmaster and called upon several past presidents for remarks. Several parodies on popular songs were given, portraying the humorous side of some entomological investigational projects and men. The dinner was considered one of the most successful ever held.—The extension entomologists and insect pest survey held a meeting Friday evening, December 31, which was attended by more than fifty members. A very interesting paper was presented by J. A. Hyslop, on "The Work of the Insect-Pest Survey," in which were ably set forth the needs for new and better methods of estimating and keeping records of outbreaks of insects and damage to crops.—Professor R. W. Harned was elected president, W. P. Flint was elected first vice-president, and C. W. Collins (Melrose Highlands, Mass.) continues as secretary of the association.

The American Society of Parasitologists held its second annual meeting on December 28, 29 and 30, 1926. About seventy-five members of the society, out of a total membership of 392, were present. An important feature of the program was the illustrated address, on Thursday morning, by Professor G. H. F. Nuttall, of Cambridge University, Cambridge, England, on "Piroplasms." Dr. Nuttall pointed out that, since the pioneer work of Smith and Kilbourne on Texas fever in cattle and the developments which followed in the control of this disease, American parasitologists have not devoted very much attention to researches on piroplasms. The retiring presidential address, by Dr. C. W. Stiles, was devoted to a very timely discussion of the subject of nomenclature. Dr. Stiles suggested that, since most of the confusion in present-day nomenclature is produced by the ignoring by investigators of some of the simplest of the rules, students of zoology be given a small amount of definite instruction in the rules and principles of nomenclature, which he designated as the "Grammar of Zoology."—Forty-five papers were listed on the program of the society, of which thirty-four were read. Of the forty-five papers, seventeen were in protozoology, twenty-seven in helminthology and one in medical entomology. About one fourth of the papers were on the systematic-morphological phases of the subject. Most of the others were experimental in content, dealing with immunity, life-cycle relations or with the economic and medical phases. An unusually large number of very interesting and important contributions were included, only a few of which can be mentioned here.

In a paper on "Species and Strains of Coccidia in Poultry," E. E. Tyzzer pointed out that there are two species of Eimeria in chickens, one non-pathogenic and the other distinctly pathogenic. W. H. Taliaferro and his coworkers presented the results of extensive experiments carried on in Honduras for the purpose of finding a precipitin test for human malaria. They concluded that a precipitin test can be devised for the diagnosis of malaria. J. H. Sandground reported that *Strongyloides stercoralis* was established in many dogs, apparently as a permanent parasite, and that previous infestations produced an active immunity to this parasite both in dogs and cats. D. L. Augustine reported that *Belascaris marginata* in prenatal infestation remains in the liver of the dog embryo, showing little or no development beyond the first larval stage. One day after birth of the young dogs the larvae may be found in the lungs and from five to six days later in the intestine. J. E. Ackert and his coworkers found that young chicks fed with a diet deficient in the fat-soluble vitamin A were definitely less resistant to the establishment and growth of the common chicken parasite, *Ascaridia lineata,* than those fed on a diet in which this vitamine was present. Catherine L. T. Lucas gave the results of studies on the amœbae of the cockroach, showing that *Endamœba blattae* (the type of the genus Endamœba) should be placed in a separate genus or at least in a different subgenus from the Endamœba of man. Septima C. Smith reported the excystation of *Iodamœba williamsi, in vitro* and *in vivo,* and gave the details of the process. W. E. Dove and G. F. White gave a report on the etiology of creeping eruption in man, in which they demonstrated that this condition in Florida is produced by the larvae of the dog and cat hookworm, *Ancylostoma braziliense.* A. R. Cahn reported the complete course of the development of a forked-tailed cercariae of the anchoroides type to the adult stage, in young fish of the family Centrarchidae. C. F. Craig and J. H. St. John demonstrated that cultural methods for diagnosing human intestinal protozoa are superior to either the sedimentation method or the direct examination of feces. A medium composed of seven parts of normal salt solution and one part of inactivated human blood serum was success-

ful for the continued cultivation of *Endamœba histolytica* over an indefinite period of time. Abstracts of these papers and the numerous other interesting contributions that appeared on the program will be published in the March number of the *Journal of Parasitology*.—The luncheon and business meeting of the society were attended by over seventy-five members and guests. The following officers were elected for 1927: *President,* R. P. Strong; *vice-president,* Edwin Linton; *members of the council for four years,* F. D. Barker and J. H. St. John.

SECTION G (BOTANICAL SCIENCES)

Vice-president and chairman, Benjamin M. Duggar; *retiring vice-president,* R. B. Wylie; *secretary,* Sam F. Trelease, Columbia University, New York, N. Y. With Section G met the Botanical Society of America (*president,* L. H. Bailey; *secretary,* I. F. Lewis, University of Virginia, University, Va.), the American Phytopathological Society (*president,* I. E. Melhus; *secretary,* R. J. Haskell, Bureau of Plant Industry, Washington, D. C.), the American Society of Plant Physiologists (*president,* F. E. Lloyd; *secretary,* Scott V. Eaton, University of Chicago, Chicago, Ill.), the Sullivant Moss Society (*president,* Robert S. Williams; *secretary,* A. T. Beals, 2929 Broadway, New York City), the American Fern Society (*president,* William R. Maxon; *secretary,* Charles S. Lewis, 835 Edgewood Ave., Trenton, N. J.), and the Wild Flower Preservation Society (*president,* P. L. Ricker; *secretary,* Clara M. Cheatham, 3740 Oliver St., Washington, D. C.).

(Reports received from Sam F. Trelease, I. F. Lewis, Paul B. Sears, S. C. Brooks, F. W. Pennell, R. J. Haskell, W. A. McCubbin and H. W. Thurston, G. W. Scarth, A. T. Beals, Edgar T. Wherry and Clara M. Cheatham)

Section G held a joint session on Tuesday afternoon with the Botanical Society of America, the American Phytopathological Society and the American Society of Plant Physiologists. The program had been arranged under the direction of the section committee and was designed to present recent progress and points of view in several phases of the botanical sciences.—Dr. R. B. Wylie gave his retiring vice-presidential address on "Leaf Structure and Wound Response." He pointed out that the leaf is very liable to wound injury, by hail, insects, grazing animals, etc. Following wounding, an injured leaf promptly develops a temporary structure, termed by Dr. Wylie the *pseudocicatrice,* which results from the death and collapse of cells near the wounded margin, together with certain secretions that may be formed by these or other cell layers. The pseudocicatrice tends both to retard water loss and to prevent infection by bacteria or fungi. Its efficiency is largely due to the incurved epidermal walls that frequently meet along the injured edge. Permanent healing tissue, the *cicatrice,* develops slowly from living cells beneath the pseudocicatrice. All the cell layers of the normal leaf, through mitosis, share in its formation. In thick leaves the cicatrice consists of cork-like tissue with thickened cell walls. These are nearly always cutinized and often suberized.—Dr. W. J. V. Osterhout spoke on "The Accumulation of Electrolytes." He said that the concentration of K in the sap of the marine alga *Valonia macrophysa* is much greater than in the sea water, and suggested that this might be due to the fact that KOH enters and reacts with acids in the sap. It may be assumed that the anions of these acids are exchanged for Cl so that K accumulates chiefly as KCl. This process may be expected to continue as long as the hydrogen-ion concentration of the sap is lower than that of the sea water, and it may be facilitated by the production of CO_2 and other acids inside the cell. The low concentration of Na in the sap could be explained by assuming that Na does not penetrate as rapidly as K. These assumptions were stated to be in harmony with the facts at present available.—Dr. F. D. Fromme read an address on "Vigor of the Host as a Factor in the Development of Disease." Among animals, he said, there is little or no correlation between bodily vigor and susceptibility. Immunity is specific; an individual may be highly immune to one disease and ultra-susceptible to another, without regard to the general health. Among plants, however, there appears to be a correlation between vegetative vigor and susceptibility. Many pathogens attack a vigorous host most readily, while others prefer a subnormal or less vigorous plant. The rusts, the powdery mildews and some of the bacterial pathogens are representative of the vigor-loving group. It was suggested that transitory foods are utilized by vigor-loving pathogens and the ample occurrence of such foods in vigorous plants may account for their predisposition.

The Botanical Society of America, with a registered attendance of 264 members, held a full and successful meeting from December 27 to 31. At the botanists' dinner the principal address was delivered by the retiring president, J. R. Schramm, editor of *Biological Abstracts,* on "The Attitude of the Scientist to Religion." President L. H. Bailey spoke on the need for better attention to and care of plant collections. The International Congress of Plant Sciences at Ithaca last August was discussed by B. M. Duggar and H. C. Cowles. Botanical publications in general and research fields were the subjects treated by William Crocker and L. R. Jones.—Officers of the

Botanical Society were elected as follows: *president,* Harley H. Bartlett; *vice-president,* I. F. Lewis; *secretary,* Arthur J. Eames (Cornell University); *treasurer,* George E. Nichols; *council representatives,* L. H. Bailey and I. F. Lewis; *corresponding members,* Erwin Baur, C. Chodat, L. Cockayne, V. Gregoire and W. Johannsen.

The general section of the Botanical Society of America (*chairman,* J. T. Buchholz; *secretary,* Paul B. Sears) met on Tuesday and Wednesday mornings and for two sessions on Thursday. Twenty-three papers were presented, the programs being so arranged as to permit considerable discussion. On Tuesday, in addition to other interesting microchemical and anatomical papers, R. O. Earl presented chemical evidence that the permanent or gene portion of the chromosomes must be something other than the chromatin and probably forms a core within it. Lively discussion followed a paper by R. H. Bowen, on the structure of plant cytoplasm as interpreted in the light of zoological technique. At the Wednesday session A. J. Eames and C. L. Wilson presented a noteworthy analysis of carpel structure in the Cruciferae, while other speakers gave valuable contributions to the life histories of various non-vascular plants. Of particular interest was the work of A. H. Tuttle, on a new species of Chara. The Thursday morning session was devoted to an informal but active discussion of botanical teaching. This session was largely attended and provision was made for future programs of the same sort. Many held the position that teaching is an art, and a highly personal one, rather than a science, but not all shared this view. Special features of the afternoon session were papers on embryology and anatomy, and one on chromosome conditions in a sterile plant. W. R. Taylor gave an extensive general account of the algae of Dry Tortugas. George P. Burns was elected chairman and Gilbert M. Smith vice-chairman for the ensuing year.

The mycological section of the Botanical Society held its usual interesting joint session with the American Phytopathological Society. Among the papers of special interest in the section program proper was an account, by C. L. Shear and B. O. Dodge, of a remarkably successful cultural attack on the question of heterothallism in ascomycetes. Heterothallism was definitely established for *Monilia sitophila.* A paper by A. H. R. Buller and Dorothy E. Newton gave the results of a method used for identifying certain Coprinus species.

The physiological section of the Botanical Society (*chairman,* C. O. Appleman; *secretary-treasurer,* S. C. Brooks) continued the activity that has marked its programs in the past. The scientific sessions were five in number: three devoted to the presentation of twenty-two contributions, one to a round table on "Growth and Development," and one to a joint session with the American Society for Horticultural Science, and the American Society of Plant Physiologists. Recent theories of Bose as to the mechanism of sap flow in trees was shown by J. B. Overton to rest upon false assumptions. H. L. Bolley presented data which seemed to show that the heritable disease-resisting power of plants could be increased by subjecting them to the disease. Much interest was aroused by G. J. Peirce's acccount of organisms living in saturated brines.—The round table on "Growth and Development" attracted great attention, the attendance exceeding that recorded for any meeting of this section in recent years. Various phases of the subject were introduced by W. H. Pearsall, Samuel Brody and Norman A. Clark, under the leadership of C. O. Appleman. Discussion centered very largely upon the applicability of various equations to the curves representing the growth process or its different phases, as shown by plants and animals. The rôle of growth-promoting accessory substances for plants was interestingly presented.—Both practical and theoretical bearings of the papers presented at the joint session of horticulturists and plant physiologists evoked discussion. This was particularly true of papers by: A. E. Hitchcock and P. W. Zimmerman, on the relation of the rooting of various cuttings as affected by the physical properties and hydrogen-ion concentration of the media used; by Carlos G. Bates and J. Roeser, Jr., on the minimum light requirements of coniferous seedlings; and by M. Dye, O. C. Medlock and J. W. Crist, who showed a very clear-cut association between greenness and vitamin-A content of lettuce. If vitamin-A is desired in the diet the choice of green as opposed to blanched leaves or stems is to be recommended.

The systematic section of the Botanical Society (*chairman,* P. A. Rydberg; *secretary,* F. W. Pennell) held the best program of recent years. The papers were marked by breadth of interest that promises well for systematic botany in America. There were three sessions, on December 28, 29 and 30. Two of the papers of the miscellaneous group may be specially mentioned: R. P. Wodehouse discussed "The Phylogenetic Value of Pollen-grain Characters," calling attention to the fact that "in most families and orders the pollen grains bear a general similarity throughout, proportional in degree to the closeness of interrelationship within the group." Dr. E. T. Wherry, under the title "Studies in the Genus Phlox," showed colored lantern slides illustrating most of the species of this genus in the eastern United States, and discussed their relationships.—The second session was a

herbarium meeting, at the Academy of Natural Sciences. Dr. F. W. Pennell discussed the representation in American herbaria of specimens of plants from different parts of the United States. Frank W. Johnson told of the methods used in cleaning and reorganizing the Clinton Herbarium, at Buffalo, N. Y., where a large collection of plants, accumulated during the early and middle part of the last century, had been neglected for many years. Dr. Pennell, curator of the Academy Herbarium (Philadelphia), spoke of the "Historical Botanical Collections at the Academy of Natural Sciences." These comprise the chief collections of plants from the United States brought together during the first decades of the nineteenth century, including collections of Nuttall, Schweinitz, Baldwin and others. The Philadelphia Academy also possesses, on deposit, the yet older collections of the American Philosophical Society, embracing the herbarium of B. S. Barton, the first professor of botany and natural history in the United States; that of the Rev. Henry Muhlenberg, who brought together the largest series of plants of this country for his time, about 1800; and the specimens gathered by Lewis on the Lewis and Clark expedition to Oregon. After the formal program visitors were taken through the general and local herbaria of the academy. The local herbarium, under the able curatorship of Bayard Long, is probably not surpassed in this country in its thorough representation of the area covered.—The third session of this section consisted of a symposium on "The Geographic Background of Taxonomic Botany." Dr. E. T. Wherry discussed this problem "As affected by the Chemistry of the Soil," showing various instances of allied species with sharply contrasted soil preferences. Bayard Long discussed the problem "As Illustrated in the Local Flora," showing how definitely marked are the areas of local occurrence of very many plants. Mrs. Agnes Chase discussed the problem "As Seen in the Study of Grasses," showing how clearly associated with particular areas is the occurrence of many species and genera through North and South America. Another contribution to the program projected into geologic time this association of definite floras with definite regions. This was a paper by Dr. Arthur Hollick, comparing contemporaneous Tertiary floras of tropical and boreal regions. The session closed with an account, by Dr. J. N. Rose, of "The Cactaceae and their Distribution"; as Dr. Rose has probably traveled more extensively and consistently in the study of a single family of plants than has any other botanist, he could show from a wide experience the application of the principles discussed during the symposium.

The American Phytopathological Society had an attendance of about two hundred at its eighteenth annual meeting. The program contained sixty-one papers: nine in its general session, three in joint session with Section G, twelve in joint session with the mycological section of the Botanical Society, and the remainder grouped under cereal diseases (7), fruit diseases (8), vegetable diseases (15), and fungicides (7). The names of sixty-six new members have been added this year to the rolls, of which six were from Japan; the total membership is now 716. Officers of the society for 1927 are as follows: *President,* M. F. Barrus; *vice-president,* H. P. Barss; *secretary-treasurer,* R. J. Haskell.—The report of the management of the journal *Phytopathology* indicated a satisfactory state of finances, increase in the size of the journal and general improvement in the quality of articles. A committee was appointed to suggest some method of securing funds for the endowment of *Phytopathology.* The program of the annual dinner of the society was especially arranged to pay honor to Dr. Erwin F. Smith and to express the deep appreciation by the society of his long and active services and of his memorable contributions to our knowledge of plant diseases. Other special features of the meeting included a conference on the plant-disease survey, wherein members were asked to report on new or unusual conditions in the occurrence of diseases from their various localities, and an excursion to the extensive Du Pont laboratories and greenhouses near Wilmington, Delaware, arranged through the courtesy of E. I. du Pont de Nemours and Company.

Some of the papers given are very briefly represented by the following statements. A hitherto obscure disease of tomato known as western yellow blight was shown by M. B. McKay and T. P. Dykstra, to be identical with the virus trouble of sugar beets called curly-top. H. L. Bolley concluded that general field selections may be profitably supplemented by further tests in gardens or plots where disease conditions are severe. Several wheat varieties and hybrids were reported, by J. J. Christensen and E. C. Stakman, to possess resistance to wheat scab. In Hawaii the virus of sugar-cane mosaic may be transmitted to corn by a leafhopper; yet, according to L. O. Kunkel, what appears to be the same insect in North Carolina is unable there to carry the sugar-cane mosaic to corn. The inference was that the Hawaiian corn mosaic may be distinct from the corn mosaic of the United States. According to Marion A. Griffiths, strains of corn resistant to smut under field conditions may be quite susceptible under conditions of artificial infection; hence the resistant quality in these strains appears to be merely failure of the incolum to reach young growing tissues. Measurement of the lesions of the nailhead-spot disease of tomatoes was made before and after shipment, by G. B. Ramsey and Alice A. Bailey, and it was found that the spots increased

in size during transit. Three years of investigation on seed treatment in vegetable crops was reported by E. E. Clayton, whose results indicated a wide variety of effects that may follow treatment of different seeds with various chemicals, the outcome including cases of growth stimulation, growth depression, protection against disease and seed injury. The outstanding features of the report of G. W. Keitt, on his further studies of apple scab, were (1) the ability of the fungus to infect apple leaves within a range of temperatures from about 6° to 26° C., with an optimum in the neighborhood of 20° C., and (2) an incubation period requiring moisture varying with the temperature, and having its shortest time, four hours, at about the optimum temperature. The same author and E. E. Wilson discussed the problem of preventing the development of the ascosporic stage and reported trials of materials applied after harvest for this purpose with some encouraging results. Edwin J. Kohl presented results on studies of apple blotch, particularly in regard to the relation of infection to weather conditions. Another phase of apple blotch was dealt with by Max W. Gardner, who demonstrated the effectiveness of blotch canker eradication in young apple trees. M. K. Patel announced that he has been able to obtain many strains of bacteria from overgrowths in nursery stock and from nursery soil, some of which resemble the crown-gall organism very closely, though they are non-pathogenic. D. H. Rose and L. F. Butler discussed a rot found on both lemons and apples in the Pacific coast states and presented evidence that the causal organism is the same for both fruits. The relation of spray applications to the storage rots of Florida citrus fruits was dealt with by Harry R. Fulton and John J. Bowman, who showed that the beneficial effect of Bordeaux mixture is greatest on the *Phomopsis* type of rot, less evident in connection with *Diplodia* stem-end rot and does not materially affect *Penicillium* rots. Florence Hedges announced the isolation of a bacterium from leaf spots of kudzu. Commercial tobacco in various forms was shown by W. D. Valleau and E. M. Johnson to be able to serve as a source of mosaic infection in tobacco fields, even after many years of storage. The experiments of E. L. Felix, on unproductive muck soils in New York, indicate that the addition of copper to the soil or its application to the leaves of crops overcame the adverse conditions. H. W. Anderson presented a theory to account for the toxicity of sodium silicofluoride to *Bacterium pruni,* involving hydrolysis and dissociation of this compound in the presence of water. Of the various materials tested by John Monteith, Jr., and T. Carter Harmon, for control of brown patch on turf, it was found that those containing mercury were most efficient and the results indicated that the control largely depended on the amount of mercury present. Ingenious methods of determining the rate of penetration of fungicides into the seed coat of corn were described by C. R. Orton. C. M. Sherer reported negative results from chemical injection into trees for the purpose of insect and disease control. Growers of conifer nursery stock will be aided by the successful results obtained by J. Stewart Wiant, on seed-bed treatment with various chemicals. C. S. Reddy outlined his investigations on dust treatment of corn seed with chlorophenol mercury. Evidence was presented by Bessie Goldstein on the existence and behavior of certain intracellular bodies in the tissues of Dahlia plants affected by mosaic. The peculiar spore habits of a fungus causing rot in conifers were described by A. H. Reginald Buller and he also advanced the view that boring insects assist in inoculating trees with this rot. Serological methods such as are employed in animal diseases were used by George K. K. Link and C. G. Sharp, in an attempt to differentiate bacterial plant parasites; the agglutination results indicated that a distinction can be made on serological grounds. Fungus cultures kept at low temperatures and then brought to room temperature showed retardation of growth corresponding to the temperatures of storage, according to data submitted by D. H. Rose and L. F. Butler. Studies of mosaic tissues of sugar cane and tobacco were reported by Melville T. Cook, who found that in diseased tissues the chloroplasts are not destroyed, though their development is retarded. That the fern-leaf symptom commonly associated with mosaic in tomato is probably a distinct disease was the conclusion drawn by Sophia H. Eckerson and H. R. Kraybill, from filtration and inoculation studies.

The American Society of Plant Physiologists had a full and varied program, with large attendance. An important feature of the Philadelphia meeting was the awarding of the first Charles Reid Barnes Life Membership of the American Society of Plant Physiologists, which was announced at the dinner for plant physiologists Wednesday evening. This projected series of honorary life memberships, one of which is to be created each year from a special fund established for the purpose, was approved by the society at Kansas City last year, in memory of Charles Reid Barnes, first professor of plant physiology in the University of Chicago. It was announced at Philadelphia that the first honorary life member of the series is Burton E. Livingston.

A series of protoplasmic and biophysical studies occupied the first session of the Society of Plant Physiologists. L. B. Becking and H. Bakhuyzen presented the first quantitative measurements that have been made of Brownian movement as a criterion of

the physical state of protoplasm, the apparent viscosity of which, calculated from Einstein's formula, ranged from that of water to one hundred times that value within four square *mu* of apparently homogeneous substance. Average consistency, homogeneity and tendency to directed movement, all show maxima about 26° C. William Seifriz presented an argument for a "brush heap" structure of proteins as the fundamental structure of living substance. G. W. Scarth described the part played by lecithin—containing films and fibrils (kinoplasm) in the organization of the cell and also reported micrurgical evidence of coherent structure in plant cytoplasm and nuclei. Interesting facts about the life of organisms in saturated brine were given by G. J. Peirce; about the lethal effects of high frequency sound waves, by F. Thone; and about the stimulating effect of X-rays on growth, by M. Jacobson.—The joint session with the Ecological Society on Wednesday included a paper by President F. E. Lloyd, on "Cecropia," in which he showed that some of its so-called adaptations to myrmecophily might be due to other causes. Another address by the president, on "Secretion and Excretion," was a feature of the dinner on Wednesday evening.—A large proportion of the papers on Wednesday and Thursday dealt with biochemical subjects. W. A. Gardner demonstrated the presence and properties of a chlorophyll-decomposing enzyme in orange rind. Chlorosis in its relation to manganese deficiency was discussed by J. S. McHargue and to low carbon-dioxide content in soil and plant by Y. Milad. An abundance of the glucoside phloridzin in active tissues of apple shoots was shown by E. M. Harvey. The reducing effect of dead seeds on dilute solution of potassium permanganate, employed as a practical test of seed viability, was discussed by R. P. Hibbard. R. B. Harvey and his associates reported on the remarkable acceleration of ripening in fruits brought about by ethylene and other gases. Quite another type of investigation was represented by H. L. Bakhuyzen's mathematical analysis of the growth curves of annual plants. According to his interpretation, rate of growth varies as the product of the structural efficiency (determined by morphological characters) and the chemical efficiency of unit leaf area. Both decrease at the time of flowering, the latter owing to dehydration.—Papers of a more practical nature also occurred in the program, especially at the joint meeting with the American Society for Horticultural Science on Friday.

The Sullivant Moss Society (organized in 1898 for the collection and study of mosses, hepatics and lichens) held its thirteenth meeting during the first three days of convocation week. The society wishes to thank Professors True, Harshberger and Taylor, of the department of botany of the University of Pennsylvania, as well as the other members of the local committee of the association, for their help toward the success of the meeting. Monday morning was devoted to renewing old acquaintanceships and arranging exhibits. An exhibit of special interest was from H. N. Dixon, who sent from England mosses from several tropical countries. Among these was *Dimorphocladon Bornense* Dixon, from Siam, shown in its usual habitat, on the surface of a leaf. Others who exhibited are: Mrs. H. C. Dunham, moss plants uniquely mounted under celluloid; Mrs. Fay A. MacFadden, mosses on herbarium sheets and photographic views of the Selkirk mountains; E. A. Moxley, mosses in Celaphane folders; Severin Rapp, Florida mosses; Lellen S. Cheney, Wisconsin mosses; A. J. Grout, two fascicles of his "Musci Perfecti"; O. E. Jennings, type specimens of new species of Catherinia; C. M. Roberts, slides and mosses for distribution. Tuesday afternoon was given over to visiting other botanical groups. Among forty or more papers, talks and demonstrations given at the sessions, the following may be specially mentioned: A paper by Mrs. Fay A. MacFadden, on "Collecting Mosses in the Selkirk Mountains of British Columbia," was read by Mrs. Gladys P. Anderson, seventy lantern slides loaned by the Canadian Alpine Club being shown. Mr. C. M. Roberts gave a paper on "Ecology of the Mosses of Central Pennsylvania." A paper by Mr. Fred W. Gray, "An Explanation of the Occurrences of Certain Cladoniae," was read by Dr. A. LeRoy Andrews, presenting observations on the appearance of new species in an abandoned area of the North Carolina Piedmont. Miss C. C. Haynes's paper, "Some Virginian Hepaticae named by the Writer," identified a number of uncommon species collected many years ago. Mrs. Gladys P. Anderson's paper, "Collecting Lichens on Mount Katahdin, Maine," was illustrated by lantern slides. Dr. A. LeRoy Andrews gave a most interesting account of a recent trip to Switzerland, of his visit to Amman and of bryological "finds" near Amman's home. Mr. C. C. Plitt, in a paper on "Succession in Lichens," pointed out that lichens having a thallus with raised edge often overrun and replace those that are more closely applied to the substratum. Mr. Robert R. Bowen gave an illustrated paper on "The Bryophyte Sperm and its Homologies with the Sperms of Animals," comparing sperm cells of Polytrichum with those of some animals. A paper by Dr. O. E. Jennings, "The Ancestry and Relationship of the Mosses," showed by a chart the origin and development of the ancestors of present-day mosses. Mr. Lellen S. Cheney's paper, "Notes on Interesting Wisconsin Mosses," read by the secretary, included notes on some very minute species seldom gathered by collectors because of their small size. Mrs. Gadsby read

a paper by Mr. Edwin B. Bartram on "Unreported Moss Species from Arizona."

The American Fern Society held a session for the reading of papers on Saturday morning. Continuing the plan inaugurated at Washington two years ago, the ferns and their allies in the region near the meeting place held a prominent place in the program. Herbarium sheets, mostly drawn from the collections of Mr. Harry W. Trudell and Canon C. S. Lewis, were shown, illustrating most of the noteworthy species known to grow within fifty miles of Philadelphia. The habitats of many of these were briefly described with the aid of colored lantern slides, by Dr. Edgar T. Wherry. Special reference was made to ferns originally discovered in the Philadelphia region: bog adders-tongue (*Ophioglossum arenarium* E. G. Britton, or *O. vulgatum* var. *minus* Moore); curly-grass fern (*Schizaea pusilla* Pursh), of the Coastal Plain; hybrid spleenwort (*Asplenium ebenoides* R. R. Scott); lobed spleenwort (*A. pinnatifidum* Nuttall); Susquehanna spleenwort (*A. trudelli* Wherry), of the Piedmont province. Canon Lewis spoke on trips to various points in the Delaware Valley and in the Adirondacks. He exhibited sheets of the ferns collected, including several very rare species from new stations. A large series of specimens of Christmas fern (*Polystichum acrostichoides* (Michx.) Schott.) sent by Rev. Fred W. Gray, of Cass, W. Va., was exhibited, and a paper concerning them was read. They showed remarkable variations in size, outline and cutting of fronds, and in position of sori. Mr. James Grimshaw Scott, son of the discoverer of the hybrid spleenwort, mentioned above, presented some interesting reminiscences of his father, and described efforts that are being made to have the fern adopted as the botanical emblem of the State of Pennsylvania.

The Wild Flower Preservation Society held its annual meeting on Monday. The following officers were elected: *President,* P. L. Ricker; *vice-presidents,* Dr. J. W. Harshberger and Dr. Henry C. Cowles; *secretary,* Miss Clara M. Cheatham; *treasurer,* S. W. Miller; *directors for three years,* Mrs. E. H. Bouton, Dr. Edgar T. Wherry and Miss Catherine A. Mitchell. A report was made by the president, on work accomplished during the past year, and a lecture, with colored lantern slides, on "The Flowers of Mt. Ranier," was given by Dr. John W. Harshberger.

ORGANIZATIONS RELATED TO BOTH SECTION F AND SECTION G

(Reports received from A. Franklin Shull, A. O. Weese, H. J. Van Cleave, George R. Green and Marjorie Ruth Ross, C. I. Reed and L. C. Dunn)

The American Society of Naturalists (*president,* J. Arthur Harris; *secretary,* A. Franklin Shull, University of Michigan, Ann Arbor, Mich.) devoted its Philadelphia meeting primarily to a symposium on "Quantitative Biology." It was most interestingly shown by various speakers that the method of counting, measuring, weighing or mapping large numbers of individuals has yielded important results, which have advanced biology measurably toward the status of an exact science. The specific materials used for illustration varied from fungi and Drosophila to domesticated animals and men, from human embryonic development to the state of civilization. The following speakers presented different aspects of the topic: J. Arthur Harris, H. J. Muller, John M. Gowan, R. E. Scammon, Ellsworth Huntington, A. H. Reginald Buller. At the annual dinner of this society the president, Professor J. Arthur Harris, renouncing the subject assigned in the advance program, humorously described the present organization of science, by means of a hypothetical institute devoted to the study of the psychology of that most humorous of animals, the mule.

The Ecological Society of America (*president,* John W. Harshberger; *secretary,* A. O. Weese, University of Oklahoma, Norman, Oklahoma) met on the three days beginning Tuesday, December 28. Joint sessions were held with the American Society of Zoologists, the American Society of Plant Physiologists and the Botanical Society of America. The president's address was on "The Vegetation of Alaska." The last session was devoted to a symposium on oceanography, with the following speakers: W. R. Taylor, "Conditions of Growth of Marine Algae at the Dry Tortugas"; W. E. Allen, "The Most Pressing Needs in the Field of Biological Oceanography"; Robert Cushman Murphy, "Factors in Marine Distribution along the West Coast of South America"; William Beebe and W. K. Gregory, "Oceanographic Work of the Arcturus Expedition."—Reports were received from the committees on preservation of natural conditions, on publication facilities and on Biotic communities, from the representatives of the society in the Council of National Parks, Forests and Wild Life, in the National Research Council and in the Council of the Union of Biological Societies, also from the editor and business manager of *Ecology* and from the secretary-treasurer. These reports are to be published in *Ecology.*—The following officers were elected: *President,* Chancey Juday; *vice-president,* W. S. Cooper; *secretary-treasurer,* A. O. Weese, University of Oklahoma; *editor of Ecology,* Barrington Moore; *representative in National Research Council,* D. S. Johnson; *representative in the Union of Biological Societies,* Barrington Moore; *representative on Editorial Board of the American Journal of Botany,* G. E. Nichols.

The American Microscopical Society (*president,* George R. La Rue; *secretary,* H. J. Van Cleave, University of Illinois, Urbana, Ill.) convened in its forty-fifth annual meeting on Wednesday, December 29, for hearing reports of officers, the transaction of necessary business and the election of officers. The secretary reported more than one hundred new members added within the year just closed and an unusual increase in foreign members and subscribers. He further reported a highly satisfactory situation with regard to the number and quality of manuscripts now being submitted for publication in the *Transactions of the American Microscopical Society.* The report of the treasurer, Dr. A. M. Chickering, revealed the fact that the treasury continues to accumulate a surplus, even though there has been a material increase in the cost of the *Transactions* as a result of an enlarged and improved volume for the current year. Under the administration of Professor Henry B. Ward, custodian and chairman of the Spencer-Tolles Fund Committee, grants are again available. Members wishing to apply for grants or to secure information concerning the fund are requested to communicate with Dr. Ward. The following officers were elected: *President,* Z. P. Metcalf; *first vice-president,* R. T. Hance; *second vice-president,* Paul S. Welch; *custodian of the Spencer-Tolles Fund,* Henry B. Ward.

The American Nature Study Society (*president,* George R. Green; *secretary,* Clara M. Cheatham) held its thirtieth annual meeting December 27 and 28. A very successful dinner was held on Monday evening with fifty-five present. The papers of the Monday morning session were devoted to the subject of nature-study in the schools—its correlation with other school studies, its supervision in large cities, its interest for children, its status of development in the schools of New York City and of Philadelphia, and the making of the nature-study outline for the National Education Association. The Monday afternoon session was devoted to papers on the purposes, aims and usefulness of the teaching of nature-study. Dr. L. H. Bailey emphasized the importance of nature-study in removing the traditional fear and dread of nature. Dr. Hanon Webb pointed out its importance in developing resourcefulness in children and Dr. Anna B. Comstock outlined its future. The Tuesday sessions were devoted to reports on organizations for the promotion of nature-study. Dr. Alden H. Hadley told about his radio talks on various phases of bird life. Mr. Arthur N. Pack spoke of the value of nature publications to nature education. Several papers dealt with the promotion of nature-study by organizations other than schools, such as scout organizations, museums, playground associations and garden clubs. Mr. Laurence V. Coleman spoke on "Nature Education in the Museums," dwelling on the efforts made by these institutions to win the interest of children by specially prepared exhibits, lectures, classes and publications.—At the business session Tuesday afternoon, President George R. Green spoke on the society's accomplishments during the past year, mentioning especially the affiliation of the society with the American Association, which secures for it a representative in the association council. The officers were reelected for the coming year. The society voted its thanks to the Philadelphia Local Committee on Arrangements, for very satisfactory accommodations for sessions and exhibition. A committee was appointed to consider the revising of the society's constitution, the committee to report at the next annual meeting. Members of the society made recommendations to its council concerning the advisability of forming a Pacific Coast branch. The president of the society was given power to cooperate in the formation of a council on nature education.

The Phi Sigma Biological Research Society (*president,* Ira E. Cutler; *secretary,* C. I. Reed, Baylor University Medical School, Dallas, Texas) held its third convention December 27, with all but two of the nineteen chapters represented. Projects were discussed and legislation was enacted pertaining chiefly to the internal organization of the society. The policy was emphasized that the maximum of freedom should be allowed to each unit, permitting adaptation to local conditions in efforts to foster the research spirit. Dr. A. M. Keefe was elected vice-president, and Dr. C. J. Reed was reelected secretary for the next four years.

Since the regular conventions of Phi Sigma are biennial, special preliminary arrangements were made for presenting a program for junior research workers at the Nashville meeting of the American Association. Increase in the number of chapters and in the productive membership gives evidence of the usefulness of such an organization as Phi Sigma, for stimulating and assisting the development of research ideals in undergraduate as well as junior post-graduate groups. Many research problems were reported and there was much discussion. In general the papers fell into the four groups: taxonomy, physiology, cytology and laboratory technique.

The Joint Genetics Sections of the American Society of Zoologists and the Botanical Society of America (*chairman,* S. G. Wright; *secretary,* L. C. Dunn, Storrs, Connecticut) held three sessions for the reading of papers on Monday and Tuesday mornings and Tuesday afternoon, and one demonstration session on Monday afternoon. These sections participated in a joint symposium on hybrid vigor, with the geneticists interested in agriculture, on Wednesday morning. Forty-three contributions were pre-

sented. Of these, twenty-five were read as papers, nine were given by demonstration, and the remainder were presented by title only. Abstracts have appeared in the *Anatomical Record* for December 25, 1926. It was shown by Elizabeth E. Jones that, in some strains of mice, hereditary resistance to a transplantable tumor may be broken down by introducing with the tumor an irritating agent such as a piece of sterile flannel; tumors so induced in resistant mice were shown to be the same as those secured in susceptible mice without the introduction of the irritating agent. R. R. Hyde discussed the relation of an inherited biochemical structure to a toxic immune body, showing that guinea pigs in which the blood lacks the ability to form complement (complement deficiency in guinea pigs is inherited as a simple Mendelian recessive trait) are not affected by injections of toxic immune sera which kill normal guinea pigs. The complement-deficient guinea pigs appeared to have an inherently different cellular structure from normal animals, which was of wider significance than the mere inability to form blood complement. Strains of pigeons differing in size of the thyroid gland have been bred by Oscar Riddle, who showed that such differences are hereditary. A. M. Banta presented evidence to show that mutations occurring under parthenogenetic reproduction in a small crustacean (Cladocera) are inherited in a manner similar to those occurring in other animals and in plants that reproduce sexually. The cause of pollen abortion in some biotypes of the Jimson weed (Datura) appeared, in the experiments of A. F. Blakeslee and J. L. Cartledge, to be due to characters in two of the twelve chromosome sets and experiments gave some indication of attachment and possible interchange between non-homologous chromosomes. A. M. Showalter showed that certain races of a small aquatic plant (Riccardia) are intersterile and that the sterility is in some cases due to the failure of the sexual nuclei to fuse normally, while in other cases fertilization occurs but development ceases before the sporophyte is formed. From a study of chondrodystrophic chicken embryos Walter Landauer concluded that the functional structures appearing in the bones are responses to mechanical conditions in early development rather than an expression of genetic or phylogenetic factors.

In the exhibit room, E. Roberts showed specimens of hairless rats and presented data showing that hairlessness is inherited as a Mendelian recessive and is independent of the gene for albinism. W. H. Eyster exhibited a series of verbena flowers, showing variegations similar to that found in maize, to which was applied a similar explanation of mutation and change within a single gene. Aquarium fish, showing sex-linked inheritance of the w-z or bird type, were exhibited by Myron Gordon, and W. F. Dove exhibited goat skulls showing the growth of transplanted horns. These and other exhibits elicited much interest, and the sections voted to encourage this demonstration method of presenting results.—R. A. Emerson was elected chairman for 1927.

SECTION H (ANTHROPOLOGY)

Vice-president and chairman, R. Bennett Bean; *retiring vice-president,* Charles B. Davenport; *secretary,* R. J. Terry, Washington University School of Medicine, St. Louis, Mo. With the section met the American Anthropological Association (*president,* Aleš Hrdlička; *secretary,* A. V. Kidder, Phillips Academy, Andover, Mass.), and the American Folk Lore Society (*president,* Louise Pound; *secretary,* Gladys Reichard, Columbia University, New York).

(Reports received from A. V. Kidder and R. J. Terry)

Dr. Charles B. Davenport's comprehensive discussion of the measurement of men was the opening paper of the meeting and the retiring vice-president's address. His review of the succession of criteria which have been recognized and utilized in "sizing up" races, stocks and individuals was a synopsis of the history of physical anthropology from simple dimensional calculations of the body and its parts to the refined methods of blood testing at the present time. New and interesting data on stature of Americans (the tallest people, according to Hrdlička) were presented by Professor R. Bennett Bean, as a result of his recent investigations of old American stock in Virginia. In Professor Raymond Pearl's discussion of "Differential Fertility" some dispassionate conclusions emerged, not the least interesting being that, although heredity plays the chief part in giving the world its geniuses there will come in the future as in the past Shakespeares and Lincolns from humble origins, owing to the infinite possibilities of germ-plasm combinations. The ever interesting and significant subject of the duration of life was dwelt upon in Professor T. Wingate Todd's paper on "Skeletal Mortality Records," based on the death-ages of recent and ancient human skeletons. This evidence clearly indicates the tendency toward the extension of the life-span in modern man, a phenomenon resulting from "greater safety and improved conditions of living." The Thursday morning session opened with a series of important contributions relating to human relationships and origins: Professor R. S. Scammon, on the "Duration of Prenatal Life, Childhood and Maturity in Man and Mammals"; Dr. Adolph Schultz, on "A Very Young Gorilla Fetus"; Dr. Morton, on "Human Origin." There followed Professor W. K. Gregory's borderline paper on "Paleomorphology of the Human

Head," dealing with the evolution of man as exemplified by cranial structure. The rest of Thursday morning was fully occupied by papers contributory to archeology and ethnology. An excellent report on the Field Museum-Oxford University Expedition to Mesopotamia in 1925–26 was presented by Mr. Henry Field, and archeology of the American Southwest was represented in the valuable communications of Mr. Neil Judd and Mr. F. H. H. Roberts. No less than five papers on or relating to Maya culture, influence and possible origin were read.

Lest this report carry the impression of a program offered only by the older and well-known investigators in anthropology it should be stated that a very commendable number of the titles were sent in by those of the younger generation, embodying original investigations of high merit. Indeed, the increasing number of recruits to this science is a most encouraging sign; the growth in membership of Section H has lately been very rapid and the number of titles sent in for the program has mounted to such an extent as to call for consideration of changes in the method of conducting the meetings.

The American Anthropological Association had many significant papers on its program, in two scientific sessions. Among these were reviews by Waldemar Jochelson on "The Prehistory of Siberia," and by Aleš Hrdlička on "Recent Findings in America attributed to Geologically Ancient Man." Miss Frances Dorrance presented an account of the remarkably successful "paper survey" of eastern Pennsylvania archeology which has been undertaken by the Wyoming Historical and Geological Society. The maps shown during the address indicated clearly how vast an amount of material is available even in our Atlantic states, which are usually considered relatively barren in archeological material.—The annual dinner of the anthropology group was complimentary, given by Colonel John S. Muckle at his home in Haverford. After the dinner Dr. Hrdlička gave the presidential address, on "An Archeological Survey in Alaska," during the course of which he called attention to the alarmingly rapid destruction of priceless prehistoric sites and the urgent need of intensive exploration. The anthropologists greatly appreciate the fine hospitality of Colonel Muckle.

So many papers were on the program that each session had to be prolonged beyond the hours originally assigned to it, and it was decided to hold at the next annual meeting in Andover, Massachusetts, a sort of stock-taking. No papers of contributions are to be read, and the program will be confined to discussions of future policy in regard to program making. There will also be symposia upon certain particularly important topics, such as the population of North America, and the salvaging of American Indian linguistic material.

The American Folk-Lore Society held at Philadelphia one independent session and one joint session with the American Anthropological Association. "The Relationship between Navajo and Apache" was the title of a paper delivered by Dr. P. E. Goddard. This discourse on a question of primary significance for the study of southwestern history called forth an unusually prolonged discussion by folklorists, ethnologists and archeologists. Professor J. Frank Dobie gave one of the thoroughly delightful papers, on "Texas Folk Lore," which have for several years been so pleasant a feature of the meetings. The joint meeting was devoted to a symposium on the relationship between the languages of Oceania and America. Similarities between the languages of these two areas are rather widely believed in abroad. The consensus of American linguistic opinion, however, as brought out in the present symposium, appears to be decidedly against the idea of any genetic relationship. The discussion was participated in by Drs. Dixon, Michelson, Mason, Speck and Swanton.

SECTION I (PSYCHOLOGY)

Vice-president and chairman, Margaret Floy Washburn; *retiring vice-president,* C. E. Seashore; *secretary,* Frank N. Freeman, University of Chicago, Chicago, Ill. With Section I met the American Psychological Association (*president,* Harvey A. Carr; *secretary,* S. W. Fernberger, University of Pennsylvania, Philadelphia, Pa.).

(Report received from Samuel W. Fernberger)

Section I did not arrange a formal program this year, inasmuch as the American Psychological Association was meeting simultaneously in Philadelphia. Section I held a meeting on Thursday evening, December 30, at which Professor Carl E. Seashore, University of Iowa, gave the retiring vice-presidential address on "Phonophotography in Measurement of Expression of Emotion in Music and Speech," in which he presented interesting results from his laboratory studies on this topic. Professor Margaret Floy Washburn, of Vassar College, vice-president for Section I, presided.

The American Psychological Association held meetings on Tuesday, Wednesday and Thursday, December 28 to 30, which were largely attended, and a very full three-day program was developed. Seventy-two formal papers were presented. These were divided by the program committee as follows: six on general psychology; thirteen on experimental psychology (in two sessions); seven on abnormal psychology; six on educational psychology; six on applied psychology; seven on clinical psychology; and six on mental mea-

surement. Besides these, there were two sessions for the presentation of reports of work by graduate students, one on clinical psychology and mental measurements (at which ten papers were presented) and one on general and experimental psychology (at which eleven papers were presented). These sessions for the reports of graduate students, not members of the Psychological Association, have created wide interest and were largely attended. Due to crowding of the program, it was found necessary to run parallel sessions both mornings and afternoons of all three days. On Wednesday afternoon no formal papers were scheduled, this period being given over to a series of round-table conferences on various topics. A conference was held on clinical psychology, another on psychological research on the pre-school child, and a third on experimental psychology. A second conference on experimental psychology was held on Thursday morning. The annual dinner was held at the Hotel Pennsylvania Wednesday evening. Following the dinner, the presidential address, on "The Interpretation of the Animal Mind," was read by President Harvey A. Carr. One of the features of the meetings was the exhibition of apparatus at which C. H. Stoelting and Company displayed almost their entire large stock of psychological apparatus and test materials; other apparatus was exhibited by members. The meeting in Philadelphia gave opportunity for showing a number of pieces of demonstration apparatus which have been developed by the department of psychology at the University of Pennsylvania.—Professor H. L. Hollingworth was elected president for the next meeting, which will be held at Ohio State University, from December 28 to 30, 1927. The American Psychological Association unanimously voted to extend an invitation to the International Congress of Psychology to meet in the United States in 1929.

SECTION K (SOCIAL AND ECONOMIC SCIENCES)

Vice-president and chairman, Joseph H. Willits; *retiring vice-president,* F. R. Fairchild; *secretary,* F. L. Hoffman, Babson Institute, Babson Park, Mass. With the section met also the Metric Association (*president,* George F. Kunz; *secretary,* Howard Richards).

(Reports received from F. L. Hoffman and Howard Richards)

The meeting this year was one of the most successful in the history of Section K. A clear-cut program on "Law Enforcement" included about twenty-two papers. The Tuesday session was opened with an address on "Should the Tax Laws be Enforceable and Enforced," by the retiring vice-president, Professor Fred R. Fairchild, who emphasized the essentials of the tax situation and the hopeless confusion prevailing at the present time in many offices. This was followed by a very thoughtful address on the "Importance of Research in Social and Economic Problems," by the vice-president of the section, Dr. Jos. H. Willits, who visualized the necessity of research in aid of a better understanding of modern social and economic problems, which by their magnitude and complexity seem to defy understanding and control. Dr. H. H. Hart, of the Russell Sage Foundation, read an illuminating address on "Law Enforcement through Self-Restraint," followed by an admirable discussion of "Laws Men break and Why," by the Hon. Edwin M. Abbott, reflecting his many years of active connection with law enforcement in the city of Philadelphia. The Tuesday afternoon session opened with an address on "Stages of Evolution and Relation to Crime," by Professor L. D. Burling, based largely upon his world-wide investigations and suggestive of many lines of thought new to American students. Dr. Joseph Mayer read an address on "Crime in the Commercial Field," which emphasized the truly appalling losses through commercial frauds common throughout this country and apparently on the increase. This session concluded with an illuminating address on "Local Crime Commissions," by Mr. James M. Hepbron, of the Baltimore Criminal Justice Commission, revealing years of close study and progressive methods of arousing the public consciousness towards a better understanding of the crime situation. Mr. Hepbron certainly established the conclusion that crime commissions can serve a useful purpose if administered as fact-finding bodies, with due regard to the actual needs of existing situations.—The Wednesday morning session commenced with an address by Mr. Charles H. Pennoyer, on "Native and Alien Criminals," followed by one on "Immigration Law Enforcement," by Dr. David Young. An extended paper on "Routine Examinations of Persons accused of Crime," by Dr. Sheldon Glueck, clearly proved the imperative necessity of expert assistance to differentiate the various degrees of criminal responsibility. The Wednesday afternoon session was introduced with a particularly suggestive address on "Women and Juvenile Criminals," by Mrs. Mina C. Van Winkle, of the Metropolitan Police Department, Washington. Mrs. Van Winkle spoke from many years of personal experience and a close devotion to an exceedingly difficult field of social control and reform. The following paper was by Dr. Charles Platt, on "Probation and Parole," and Dr. Thomas V. Moore gave an enlightening address on "Remedial Possibilities in Juvenile Delinquency."—Thursday morning papers were read on: "Enforcement of Building and Housing Legislation," by Mr. James Ford; "The Sale of Firearms,"

by Hon. William McAdoo; "Capital Punishment," by Warden Lewis E. Lawes, of Sing Sing Prison. These and other papers aroused more or less discussion and, while the audience was small, it was obviously representative of earnest-minded men concerned with the problems represented.

At the concluding session on Thursday afternoon three papers were read: on "Law Enforcement and Burglary Insurance," by Professor E. B. Crooks, on "The Chaotic American Prison," by Professor A. H. MacCormick, and on "Cooperation *vs.* Coercion, a Problem in Forestry Legislation," by Professor Ralph S. Hosmer.—All the papers bore the stamp of extended and thoughtful consideration as contributions towards what is probably the most important question in American public life at the present time. Eight or ten of these of special interest will be printed in *The Scientific Monthly*. It is to be hoped that the papers will all be published, and that in course of time they may reach a wider group of intelligent readers.

The Metric Association held its tenth annual meeting on Monday. Among the speakers were representative manufacturers, scientists, educators, government and state officials and a representative of the Republic of Mexico. Walter Wood opened the meeting with a comprehensive outline of the responsibility we all share in the work of bringing about the general use of metric weights and measures. Theodore A. Seraphin and Henry D. Hubbard emphasized the importance of measurement in human life and the necessity of effecting standardization that will give to the people of America a simple, international language of quantity. Mr. Seraphin estimated that several hundred millions of dollars can be saved through a change to the metric system and he emphasized the importance of this change being considered by the National Weights and Measures Conferences, held each year at the U. S. Bureau of Standards.—Hon. Frank Suastegui, commercial attaché to the Mexican Embassy at Washington, attended the sessions as the official representative of the Republic of Mexico. He indicated that one of the obstacles which stand in the way of better and more important trade relations between the United States and Mexico is the American system of weights and measures. J. L. de Rabot stated that nine out of ten people in the United States agree that the metric system is best. Howard Richards gave a talk on the origin, history and development of the metric system, illustrated with stereopticon slides. Glen W. Warner stated that 27 per cent. of the numerical problems and 70 per cent. of the physical constants would be eliminated if metric units were used exclusively.—At the business session the following officers were elected for 1927: *President,* George F. Kunz; *first vice-president,* Walter Wood; *second vice-president,* Wm. Jay Schieffelin; *third vice-president,* Eugene C. Bingham; *secretary,* Howard Richards; *treasurer,* Frederic L. Roberts.—Two resolutions were adopted, one urging congressional action on pending metric legislation and the other expressing to the Republic of Mexico appreciation for its cooperation through representation at this meeting.—A metric luncheon occurred Monday noon and the metric dinner on Monday evening brought to a close the most successful meeting the Metric Association has ever held.

SECTION L (HISTORICAL AND PHILOLOGICAL SCIENCES)

Vice-president and chairman, W. Carl Rufus; *retiring vice-president,* W. A. Oldfather; *secretary,* Frederick E. Brasch, Library of Congress, Washington, D. C. With Section L met the History of Science Society (*president,* James H. Breasted; *secretary,* L. Leland Locke, 950 St. Johns Place, Brooklyn, N. Y.).

(Report received from Frederick E. Brasch)

The second meeting of Section L with the History of Science Society was held Wednesday, with a morning and an afternoon session. The program was supplied by the society. No retiring vice-presidential address was read, since Dr. Oldfather was unable to be present.

The History of Science Society this year emphasized in its program early phases of American Colonial science, which was not at all backward for its time. Dr. Lao G. Simons gave a most instructive paper upon Colonial algebra, and the beginning (about 1730–38) of possibly the first text-book of algebra in this country, by Isaac Greenwood, who was the first Hollis professor of mathematics at Harvard College. Abundant evidence regarding the teaching of algebra was found still earlier in manuscript notebooks, commencement theses, advertisements and books printed in the Colonies. Evidence of astronomical activity in the Colonies was clearly shown in a paper presented by Dr. W. Carl Rufus, on the life and work of David Rittenhouse (1732–96), of Philadelphia. Rittenhouse and his contemporary, John Winthrop, of Harvard College, are of outstanding importance in the history of astronomy in Colonial America. Self-educated in mathematics and practical astronomy, Rittenhouse was a genius in mechanical technique. He was the maker of the first refracting telescope made in this country. Another outstanding figure in the early history of science in America is that of Joseph Priestley, chemist and historian of science and friend of Benjamin Franklin, Count Rumford and John Winthrop. Dr. C. A. Browne detailed the life and work of this remarkable scholar, from his struggles with religious fanaticism in England, late in the eighteenth century, to his retirement and settle-

ment at Northumberland, Pennsylvania. Dr. John W. Harshberger gave an illustrated lecture on the botanical studies of John and William Bartram, of Philadelphia, whose old homestead is now a part of a public park. The lives of early American geologists, especially of those that carried out the first state surveys of Pennsylvania, were dealt with in a paper by Dr. George P. Merrill. Geology as a science was not known during the Colonial period and Dr. Merrill spoke of the period from the Revolution to 1850. Edwin W. Schreiber discussed Colonial mathematical instruments and recalled the work of George Washington as a surveyor and his skill in map making. Many of his drawing and surveying instruments are still extant at Mount Vernon. Mr. L. Leland Locke detailed the mechanical development of the calculating machine from the beginning to the present day. Dr. Joseph Mayer gave a brief survey of the progress of science in the United States, beginning with Franklin and Count Rumford and concluding with Michelson and his contemporaries. He emphasized the importance of pure research to the welfare of the nation and also the part industries must take in order to maintain themselves. Dr. Edgar F. Smith gave a historical personal account of his efforts in teaching and interesting students in the history of chemistry. He illustrated methods by which this subject may be made attractive and of cultural value. Portraits, autograph letters, original papers and apparatus are employed to secure that end. Dr. D. E. Smith described similar results secured by similar methods in the teaching of the history of mathematics for the past thirty years. Members and friends of the History of Science Society greatly appreciated a complimentary luncheon given by Dr. Edgar F. Smith, who also entertained the council of the society at dinner Tuesday evening. Following are the officers of the History of Science Society, elected for 1927: *President,* David Eugene Smith; *vice-president,* Edgar F. Smith; *recording secretary,* C. A. Browne, Washington, D. C.; *corresponding secretary and treasurer,* Frederick E. Brasch, Library of Congress, Washington, D. C.

SECTION M (ENGINEERING)

Vice-president and chairman, C. R. Richards; *retiring vice-president,* C. R. Richards; *secretary,* N. H. Heck, U. S. Coast and Geodetic Survey, Washington, D. C.

(*Report received from N. H. Heck*)

Section M held sessions for the presentation of papers on Wednesday morning and afternoon at the Franklin Institute, and a dinner at the Bellevue-Stratford Hotel, at which several addresses were given. The dinner was given under the auspices of the Engineers Club of Philadelphia, and the arrangements were made by its secretary, Mr. Charles E. Billin. Vice-president C. R. Richards had arranged the program and presided at all the meetings. The program consisted mainly of a symposium on the contributions of pure science to engineering, to emphasize the place of section M as a connecting link between the practical engineer and the fundamental scientist.—Dr. Frank Schlesinger discussed the help that astronomy has given to engineering, and conversely. The discovery of helium was made first by an astronomer examining the sun's spectrum. Dr. Henry B. Ward pointed out that, as the raw materials for many industries are of animal and vegetable origin, a knowledge of these is of great importance to the industrial engineer. Among the contributions of biology to engineering are the control of fermentation, methods for sterilization, methods for flood prevention by proper tree and shrub planting, protection of harbor works against the teredo and the contribution of studies of the flight of birds to aviation. Dr. Charles H. Herty spoke of the contributions of chemistry to the advancement of engineering and industry, pointing out such examples as the discovery of the coal-tar products, the production of a lard-like fat from cottonseed oil, and the new lacqueroid products which have recently revolutionized the lacquer industry. Professor Joseph H. Willits, discussing the contributions of economics to engineering and industry, likened industry to a fine ship manned with fine seamen, but he pointed out that fine ships and fine seamen could not carry on without the science of navigation. Economics is the navigation of industry. A study of the business cycle leads to the improvement of stability and the possibility of forecast. Dr. Henry Ries pointed out that the science of geology arose in response to the needs of miners. In railroad construction there are many problems, as in the case of landslides, that need to be solved by the geologist. The geologist is of great service in estimating other natural resources, such as oil, coal and minerals. Professor G. A. Bliss made it clear that, while many valuable applications of mathematics to engineering are being made, the duty of the pure mathematician is to keep his science well in advance of practical needs. The use of the more elementary mathematics is, of course, essential to business. Cost computations may often be more readily handled or understood by the use of mathematically constructed curves, and problems of design often yield to mathematical treatment. Proper use of mathematics in regard to statistics is essential in many industrial problems, especially those of insurance. Dr. R. C. Rosenberger spoke on the interdependence of medical science and engineering in such problems as water supply, sewage disposal, removal of poisonous dusts and fumes, improving factory construction and the handling of milk and other perishable products.—In the absence of Dr.

R. A. Millikan, who was to have spoken, Dr. Howard McClenahan discussed the contributions of physics to engineering and industry. Physics has developed the means of measuring the physical properties of the materials the engineer has to use, such as tensile strength, hardness, flexibility and elasticity. A better knowledge of the physics of the atmosphere led to a change of design of projectiles that vastly increased their range. Dr. J. McK. Cattell spoke of the value of psychology to industry; we can improve conduct by altering the physical environment and obtain the behavior we want by putting individuals in the right place. The introduction of machinery into industry made slave labor and child labor unnecessary; the increase in wealth has made education widespread and democracy possible. The success of psychological tests in schools and in the army indicate great possibilities for their use in industry.

Papers on "Low Frequency Surges" and "Dynamical Effects of Moving Loads on Bridges" were given by Professor S. Timoshenke and Professor Vladimir Karapetoff, respectively. Mr. Harrison P. Eddy discussed an important practical application of scientific research in the development of the Imhoff Tank for sewage disposal. Dr. Willis R. Whitney spoke on the stimulation of research in pure science that has resulted from the needs of engineers and of industry, and Mr. W. H. Fulweiler spoke on the relationship between science and the study and testing of engineering materials.—Dr. Whitney's paper is to appear in the *Journal of the American Society of Mechanical Engineers,* where abstracts of the other papers will also be published.

SECTION N (MEDICAL SCIENCES)

Vice-president and chairman, Rufus I. Cole; *retiring vice-president,* A. J. Carlson; *secretary,* A. J. Goldforb. With the section met the Society of American Bacteriologists (*president,* Hans Zinsser; *secretary,* J. M. Sherman, Cornell University, Ithaca, N. Y.).

(Reports received from A. J. Goldforb and J. M. Sherman)

Dr. A. J. Carlson opened the meeting of Section N with a charming, closely reasoned discussion of science as taught in medical schools and other schools of science. This address was the retiring vice-presidential address for the meeting. Dr. Carlson spoke of a widespread confusion by which facts of science are apt to be substituted for methods of science. He outlined a state of society in which true scientific method would be practiced everywhere. After the vice-presidential address followed a symposium on "Growth in Health and Disease." Dr. Oscar Riddle gave a fine critique of what is known of growth and death of the two sexes in utero, emphasizing recent work on mammalia. He clearly developed the theme that the differential death-rate is not due to inherent weakness of the male, but to differential growth of the various parts. Dr. Raymond Pearl developed a method of measuring the fundamental and most difficult protoplasmic or "organization" differences of individuals. For experimentation with flies he measured the death-rate in starvation (without a disturbing food factor) and the curve produced was taken as a measure of the difference in organization of the flies studied. Similar studies on seeds give amazingly corresponding curves. This was not only a corroboration, but an indication that this method will serve to measure differences in the "organization" of other organisms. Dr. W. J. V. Osterhout made a notable contribution, showing that neither vitalism nor Donnan's chemical principle can elucidate differential absorption of substances through the membranes of the living cell. By brilliant reasoning he showed that the equilibrium within the cell and its regulatory mechanism may be explained in terms of known and relatively simple chemical principles. Hormones were discussed by Drs. W. W. Swingle and Frederick S. Hammett. Dr. Swingle discussed the rôle of the suprarenal cortex, pointing out one source of confusion in the presence of accessory suprarenal glands. He had made an elaborate study of the blood chemistry of animals after the cortex had been removed, and found that the outstanding, constant and new factor was an acid intoxication. This developed repeatedly until the kidneys could no longer meet the situation, and then death followed. It is this acid intoxication which is regulated by the suprarenal cortex. Dr. Hammett made a very notable contribution to the understanding of the rôle of the thyroid. After removal of the thyroid, each of the various organs of the body grew at very different rates, not only for any given age, but at different ages. There are resistant tissues whose growth change is minimal, such as the eyeball, spinal cord, ovary, uterus. A second group of tissues shows growth profoundly altered, such as the pancreas, liver and other visceral organs. In a third group special peculiarities of growth are shown, such as the thymus and testis.

The second symposium was on "Some Biological Aspects of Medical Problems." Dr. L. O. Howard gave an interesting review of the manner in which medical and entomological sciences have tended to bring into closer association these two groups of workers, and he emphasized the need for a national institute where these workers might be brought together and the many unknown insects related to the known injurious ones might be studied. Dr. C. L. Shear discussed the relation of fungi to human beings

and animals. He pointed out a great paucity of information, with much confusion of terminology and of developmental stages, and made a plea for a more intensive study of the fungi that are related to those known to cause disease. Dr. J. F. Siler presented a lucid review of the experiments that had convinced him that dengue fever is caused by a filterable virus transmitted by *Aedes egypta*. He determined how long the mosquitoes were infected and how long the patient was infected. He found that the virus did not pass into the egg and that *Culex* is not the transmitting agent. Dr. R. Bennett Bean reviewed the history of the classification of human types, giving a comparative description of each type, including psychic characteristics. He emphasized the significance of this classification to medical science. Dr. Edgar Allen discussed his experiments with monkeys in which he had injected the follicular hormone before and after removal of the ovaries. He brought out the profusion of physiologic and histologic changes in the various parts of the uterus, the nipples, skin and oestrous cycle, and showed that all these changes and the precocious onset of the oestrous cycle could be brought about by such injections.—These papers will appear in *The American Naturalist*.

The Society of American Bacteriologists met on December 28, 29 and 30, at the Bellevue-Stratford Hotel, where all the meetings were held, as were also the annual banquet and the smoker given by the local members. The attendance at the meetings was the largest in the history of the organization. Among the special features of the meetings were a symposium on "Filterable Viruses," another on "Some Problems in Soil Bacteriology," and one on "The Teaching of Bacteriology in Institutions other than Medical Schools." The address of the retiring president was given by Dr. Hans Zinsser, on "The Interdependence of Research and Teaching." The society will hold its 1927 meeting in Rochester, N. Y. The following officers were elected for the year 1927: *President,* Robert S. Breed; *vice-president,* Alice C. Evans; *secretary-treasurer,* James M. Sherman; *councilors,* S. Henry Ayers, Robert E. Buchanan, A. Parker Hitchens and Frank M. Huntoon.

SECTION O (AGRICULTURE)

Vice-president and chairman, C. F. Marbut; *retiring vice-president,* C. V. Piper (*deceased*); *secretary,* P. E. Brown, Iowa State College, Ames, Iowa. The following organizations met with Section O at Philadelphia: The American Society of Agronomy (*president,* W. L. Burlison; *secretary,* P. E. Brown, Ames, Iowa); the American Society for Horticultural Science (*president,* E. C. Auchter; *secretary,* C. P. Close, College Park, Md.); the Society of American Foresters (*president,* S. T. Dana; *secretary,* G. H. Collingwood, U. S. Forest Service, Washington, D. C.); the Potato Association of America (*president,* Daniel Dean; *secretary,* W. M. Peacock, Washington, D. C.); the Crop Protection Institute (*chairman,* W. C. O'Kane; *secretary,* Paul Moore, National Research Council, Washington, D. C.); and the Geneticists Interested in Agriculture (*secretary,* R. J. Garber, Morgantown, W. Va.).

(Reports received from P. E. Brown, C. P. Close, G. H. Collingwood, Walter M. Peacock, Paul Moore and R. J. Garber)

Section O held a joint session with the Society of American Bacteriologists Wednesday afternoon, for a symposium on "Some Problems in Soil Bacteriology." Papers were presented dealing with fermentation characters of legume bacteria, taxonomy of the legume bacteria, nitrate accumulation in soils following the growth of crops, the nature of soil organic matter and the rôle of micro-organisms in its formation and decomposition, and studies on the general soil flora. On Thursday the section program consisted of papers on price as a factor in the food limit for the population of the United States, possibilities of the reduction of wheat production to a self-sufficiency basis, the agricultural surplus, increasing production per worker in agriculture and more extensive utilization of electric power in agriculture.—The annual dinner of Section O and all affiliated societies was held Thursday evening, when Dr. Jacob G. Lipman delivered an address on "Factors of Significance in the Development of European Agriculture."

The American Society of Agronomy held its winter meeting on Friday morning, the program consisting of a symposium on "Procedure and Results of Small Grain Breeding," arranged by T. A. Kiesselbach. Papers were given on theoretical aspects of small-grain breeding, a program for selecting and testing in successive generations following hybridization of small grains, mechanical operations of small-grain breeding, what has been accomplished by breeding small grains, and the distribution and maintenance of improved varieties.

The American Society for Horticultural Science met on Tuesday, Wednesday, Thursday and Friday. There were ninety papers on the program, thus making it necessary to divide into fruit and vegetable sections on three half days. Some of the items presented follow: The response of catalase activity of various tissues to relative length of day and night is largely localized in the bud. Measurements of Worden grape canes at the time of the 1926 pruning indicated practically no correlation between diameter of cane and its probable crop production. Ethylene or propylene, 1 part to 2,000 of air, for twelve to thirty-six hours, caused loss of astringency in per-

simmons within a few days, but the flesh softened and the marketing period was shortened; ethyl acetate, 1 part to 25,000 of air, for twelve to thirty-six hours, had the same effect, as did also ethyl chloride, 1 part to 50,000 of air; Gore's method of using carbon dioxide for twenty-four to forty-eight hours removes astringency from persimmons without greatly shortening the period of marketing. When nitrate of soda, ammonium sulphate or calcium cyanide were applied before blossoming to nitrogen-starved Winesap apple trees there was the highest percentage of nitrogen during bloom and in late June where nitrates were used, and less where calcium cyanide was used. Low-yielding fruit trees have a much higher proportion of starch and total carbohydrates to nitrogen in the vegetative shoots than have those of better developed, higher-yielding trees. The position of the top bud of the scion in relation to the points of best callus union greatly affected the stand and growth of grafts; piece-root grafts were as successful in the pear as in the apple and all portions of the root were equally satisfactory in grafting. Apple types that form many shoots on the root are easily propagated by mound layering, while trench layering is useful for types forming few shoots. Sweet-orange stocks are subject to gumosis but are congenial to the common orange and lemon varieties, while sour-orange stocks are resistant, though not always congenial; but it seems possible to select a sour stock both resistant and congenial. Where mild winters are prevalent the roots of apples and filberts apparently grow all winter. Propylene is more effective than ethylene in ripening tomatoes at periods of two to four days; ethylene chlorhydrin, at 16–18° C., for more than one day, is decidedly toxic; starch hydrolysis is accelerated by propylene. Acid phosphate at the rate of 500, 1,000 and 1,500 pounds per acre increased the yield of squash 15.2, 8.5 and 18.6 per cent., respectively; cabbage also responded to the same treatment. Sweet corn with moisture below 45 per cent. is not injured at 110° F. for forty-eight hours; 38° F. will cause injury to corn proportional to its immaturity. Cross-pollination was unsuccessful on Delicious apple blossoms when yellow bags were used, some success followed the use of glassine bags, but commercial success resulted when pollination was done beneath a mosquito-netting tent. Under controlled conditions in Illinois several important varieties of gooseberries are self fertile, while in England they are not. Forty-four days after bloom Elberta peach pits were hardening, but it was eighty-three days after bloom before the cotyledons occupied all the space formerly filled with nucellus. Exceptionally favorable nutritional conditions will slightly increase ability to set fruit in the lateral blossoms of Stayman Winesap and Paragon apples and that of both lateral and central blossoms of Winesap and Arkansas Black apples; but a very large number will remain incapable of development. Primary buds of Concord grape at nodes where secondary buds also grew produced 300 to 400 per cent. more fruit and 135 to 190 per cent. larger clusters than did shoots from secondary buds. With asparagus plants, root pruning and root desiccation at planting time resulted in decreased yields, at least for the first two years. Asparagus plants cut one year after planting produced as heavy a crop the second year as similar plants cut the second year only. Staminate asparagus plants produced heavier crops than pistillate plants; in California it is possible to select male plants in the nursery. In melons, the interval between pollination and fruit ripening and the average weight per seed are the same under self and cross fertilization, and the kind of pollen had no effect on the color, texture, flavor or aroma of the pericarp. Shading apple trees with muslin tents resulted in inhibition of blossoming, apparently correlated with an increase of nitrogen and decrease of starch, also thinner and larger leaves, early leaf fall, poorly matured terminals, a long, curling type of growth, and death of many spurs, and it retarded the opening of blossom and leaf buds in the spring. Seven-year-old Jonathan apple trees kept the moisture content in the upper three feet of soil 2.5 per cent. lower than that in a similar plot without trees. Apple bark determinations covering two years indicate that fruiting tends to reduce catalase activity. Dormant onion sets treated with ethylene and planted at once grew faster and yielded more than untreated sets. Tests with albino rats supplied with vitamin A in lettuce showed that green-leaf lettuce is the best source of the vitamine, outer leaves of head lettuce the second best source, and the inner, blanched leaves of head lettuce the poorest source.

The Society of American Foresters held its twenty-sixth annual meeting from December 29 to 30. Two subjects occupied the larger portion of the program: the practice of forestry on private lands in the United States and the relationship between weather and forest fires. In addition, papers were presented on nursery practice in Pennsylvania and on the general progress of forestry in the United States.—For the practice of forestry on private lands decided optimism was shown. Papers were presented from the point of view of private foresters, schools of forestry, the U. S. Forest Service, state foresters and extension foresters. Without doubt the educational efforts of these various agencies are beginning to bear fruit, and evidence was shown that forestry is being practiced in the woods as well as on paper. As Colonel Greeley, chief forester of the United States, remarked, "It is a mark of progress that for-

estry in America is becoming more and more a function of private land owners as compared with government operation. The future of forestry undoubtedly rests with the private owners and operators."—It was brought out that forest utilization and forest management are both basic to sound national progress and that forestry can not go ahead without the support of both. Forestry is so much a matter of economics and effective land utilization that the forest schools were repeatedly urged to provide increased opportunity for their students to study economics, with special emphasis upon business administration.

The close relationship which weather bears to forest fires has been recognized for many years, but seldom have a group of foresters been able to listen to such able discussions of this subject as were presented at Philadelphia. Dr. C. F. Marvin, Mr. E. B. Calvert and others of the U. S. Weather Bureau made many helpful contributions to this part of the program, which took on the nature of a joint session between foresters and meteorologists. M. F. Burrill stated that when atmospheric humidity is reduced to 7 per cent. or below, all forest material is in highly inflammable condition.—The possibility of further coordinating the activities of the Weather Bureau with those of the Forest Service, state foresters and forest fire protective associations, in foreseeing unusual periods of fire danger, was brought out in the papers and in the discussion.—All the papers were of a high order, and discussion was active and by a large number. About 130 men, which is approximately 10 per cent. of the society membership, were present during the two days session.

The Potato Association of America held its thirteenth annual meeting on December 28, 29 and 30, which was well attended and was said to be the best meeting ever held by the association. The following are the main topics that were discussed: "Certified Seed Potatoes," "Potato Storage and Marketing," "Potato Production Methods" and "Chemical Seed Treatments and Disease Control Methods." There were also a number of miscellaneous papers. The report of the committee on seed-potato certification aroused much interest, especially with reference to standardizing the certification rules and protecting the buyer against fraud. Other factors influencing the quality of seed potatoes were discussed and also methods of testing certified seed. The various phases of storage and marketing were dealt with by specialists. Much time was devoted to improved methods in potato production.—The following officers were elected for 1927: *President,* H. C. Moore; *vice-president,* F. M. Harrington; *secretary,* Walter M. Peacock, Takoma Park, D. C.; *treasurer,* E. V. Hardenburg; *editor and business manager,* Walter M. Peacock.

The Crop Protection Institute held a dinner-meeting on Tuesday. The members of the institute are in different branches of science and, since it is difficult to find time during the annual meetings of the American Association that is free to all of them, the proceedings at the institute meeting are usually confined to very brief reports. But more than fifty members of the institute had papers or reports on the programs of different special sessions at Philadelphia. At the institute's own meeting the secretary-treasurer gave brief reports showing what the institute was expending, on an average, about $20,000 a year. It was suggested that if there were an endowment of $50,000 a year (admittedly difficult to secure from an industry "all shot to pieces" and in the face of a constant front-page cry of surplus crops!) an equal amount might then be raised from special sources. In such a case the cooperative methods of the institute would more than double the work value of the funds.—Professor W. C. O'Kane, chairman of the board of governors, outlined investigational problems being conducted by the institute. The study of "scalicide," about to close, had been conducted over a period of about four years, with headquarters at State College, Pa. Additional work had been carried on at Amherst, Mass., under the supervision of Professor A. I. Bourne. The committee in charge consisted of H. W. Thurston, H. W. Anderson and P. J. Parrott. The study of crown gall is still under way, the investigators being A. J. Reiker, J. H. Muncil and M. K. Patel. The committee consists of I. E. Melhus, G. W. Keitt and M. F. Barrus. Dr. C. R. Orton is carrying out studies on seed-borne parasites at the Boyce Thompson Institute, the Crop Protection Institute's committee on this subject consisting of William Crocker, M. T. Munn and W. L. Burlison. L. L. English, under a committee consisting of W. P. Flint, John J. Davis and J. H. Houser, is studying certain spraying oils, at the College of Agriculture of the University of Illinois. The study of copper compounds has resulted in the development of a colloidal copper that promises to be useful. This work is being conducted by Frank Wilcoxon, at the Boyce Thompson Institute, under a committee consisting of William Crocker, R. W. Thatcher and N. J. Giddings. Another study in progress is that of the proprietary compound known as "Flit." Franklin C. Nelson is working on this at the New Jersey Experiment Station, the committee being J. T. Headlee, C. H. Hadley and W. C. O'Kane. It is expected that two new investigations will be started at once, one on furfural and the other on callus.—The speaker of the evening was Dr. George D. Beal, assistant director of the Mellon Institute. His subject was "Research Organized and Unorganized."

The Geneticists Interested in Agriculture held their seventh annual meeting jointly with the Joint Genetics Sections of the American Society of Zoologists and the Botanical Society of America on Wednesday morning, December 29, with about one hundred persons in attendance. The greater part of the session was devoted to a symposium on "Hybrid Vigor in Plants and Animals." Dr. L. J. Cole discussed hybrid vigor in animals, pointing out that the study of this is much more difficult in animals than in plants. Crossing is recognized as the best means of combining increased vigor with greater uniformity. With both animals and plants crossing should be preceded by inbreeding, in order to obtain a greater degree of homozygosity before the cross is made. Dr. D. F. Jones presented new evidence for the factor hypothesis of hybrid vigor inheritance. He called attention to the lack of evidence for the stimulus hypothesis and remarked that some apparent evidence for the stimulus hypothesis may be satisfactorily explained on the factorial hypothesis if it is accepted that not all growth factors are dominant and that new factors may arise by mutation. Dr. Jones reported that he had been able to secure much improved types of sweet corn by inbreeding followed by crossing. In these studies a sterile-tassel strain was found, in which the factor for sterility was closely linked with the yellow endosperm factor. This offers great possibilities in facilitating the mechanics of crossing.—Following the symposium Dr. H. H. Love presented a very interesting paper on "Plant Breeding Possibilities in China." He spoke of the great possibilities for crop improvement there. Cornell University is cooperating with the University of Nanking in introducing American plant-breeding methods in China. Breeding crops for disease resistance is an especially imperative need.—Dr. E. Roberts (Illinois Experiment Station, Urbana, Illinois) was elected chairman for the coming year.

SECTION Q (EDUCATION)

Vice-president and chairman, Melvin E. Haggerty; *retiring vice-president,* Otis W. Caldwell; *secretary,* A. S. Barr. With the section met the Phi Delta Kappa Fraternity (*secretary,* Clayton R. Wise, 10403 St. Clair St., Cleveland, Ohio).

(Report received from A. S. Barr)

The Philadelphia program of Section Q extended over a period of three days, with six sessions. Two sessions were devoted to miscellaneous researches, one session to personality and character education, one to college-student personnel, one to college instruction and one to college curricula and administration. The annual Phi Delta Kappa dinner occurred Tuesday evening, at which time Dr. Otis W. Caldwell gave the retiring vice-presidential address for the section, on "What is the Scientific Study of the Curriculum?" The speaker reviewed briefly the methods of research in the more exact sciences of physics and chemistry and recommended similar procedures in curriculum construction. Each research should be definitely limited in its scope, exact in its methods and foundational in character. Great truths have been derived in other sciences through cumulative research in a given field and education should profit by such experience.—Twenty-two investigations were reported. Papers were read by Gates, Courtis, McCall, Meyers, Whipple, Uhl, Wallin, Grinstead, Rugg, Didcot, Reves, Baker, Boyer, Butterweek, Cook, Gregory, Webb, Mead, Adams, Shaw, Garver, Reeder, Gerney, Ryan and O'Rourke. One of the most interesting of the papers was that given by Whipple, on "An Experimental Analysis of Music Style." By the use of lantern slides and selection on the Duo-Art piano, Whipple illustrated the procedure by which musical style might be definitely resolved into a series of dots and dashes. Courtis spoke on the "Law of Biologic Growth" arriving at a formula for growth. McCall spoke on "Some Fruitful Friction Points between Measures, Philosophers and Administrators of Education." After laying down a series of theses, he pointed out that many educators found it necessary, in order to get recognition, to coin new terms for old ideas, or to take an extremist point of view—all to the detriment of education. The speaker took as an illustration the field of human motives, to which many terms have been applied, "motives," "drives," "desires," "tendencies," etc. His plea was for telescoping these many overlapping terms into one "desire." Gates reported certain experiments relative to the effectiveness of phonics. Three methods were compared: (1) no phonics, (2) phonics, (3) the natural method. The third was found to be most effective. Uhl spoke on the "Relation of Intelligence to Time Expenditure in and out of School."—The program on personality and character education was a strong one. Papers were given by Terry, May, Starbuck, Blanchard, Anderson and Leatherman. Anderson gave a very stimulative discussion of the "Social Interaction of Young Children observed under Controlled Conditions as a Measure of Personality." The paper is important not merely because of its findings but because of the suggestive procedure used in the experiment. It represents an attempt to apply objective methods to social behavior. May's paper had a similar interest. He reported on experimental studies of problems of conduct and gave one of the most interesting papers of the entire meeting.—In three sessions on collegiate education, papers were given by Wood, Leonard, Kitson, Pechstein, Waples,

Trow, Engelhardt, Henmon, Clark, Creamer, Kornhauser, Kellogg, Crawford, Edgerton, Good, McCluskey, Paterson, Spence, Jones, Anderson, Creager and Wickenden. Each paper represented a scientific investigation in the field of collegiate education.

The Philadelphia meeting represents a new high mark in the growth of Section Q. There were fifty-eight papers presented, each dealing with some recent scientific investigations in education and every one of high quality. Attendance was very good.

ORGANIZATIONS NOT SPECIALLY RELATED TO ANY PARTICULAR SECTION OF THE ASSOCIATION

In addition to those named under the several sections, the following organizations met with the association at Philadelphia: The Society of the Sigma Xi (*president,* F. R. Moulton; *secretary,* Edward Ellery, Union College, Schenectady, N. Y.); the American Association of University Professors (*president,* W. T. Semple; *secretary,* H. W. Tyler, Massachusetts Institute of Technology, Cambridge, Mass.); the Gamma Alpha Graduate Scientific Fraternity (*president,* F. H. Krecker; *secretary,* Carroll W. Dodge, Harvard University, Cambridge, Mass.); the Sigma Delta Epsilon Graduate Women's Scientific Fraternity (*president,* Kathryn Wyant; *secretary,* Julia T. Colpitts, Ames, Iowa); and the Pi Mu Epsilon Mathematical Fraternity (*director-general,* E. D. Roe, Jr., 123 West Ostrander St., Syracuse, N. Y.).

(Reports received from Edward Ellery, H. W. Tyler, Carroll W. Dodge, Julia T. Colpitts and E. D. Roe)

The twenty-seventh convention of the Society of the Sigma Xi was held on December 28, with President Moulton in the chair. Delegates were present from twenty-four chapters and three clubs. Charters for chapters at the University of Arizona and Michigan State College were unanimously voted. Announcement was made that a fellowship award of $1,000 had been granted to Sir Ernest Rutherford, director of the Cavendish Laboratory, University of Cambridge, England, because of the quality and constancy of the research work of that laboratory and because of the sincere cordiality met with by the American students there; also an award of $100 to Professor Ann Morgan, of Mount Holyoke College, for work on the blood by means of supravital technique. The constitution of the society was amended to include in the executive committee the retiring president, to hold office for two years. Professor George A. Baitsell, of Yale University, was chosen as a member of the executive committee for five years, to take the place of Professor C. E. McClung, whose term of office expires at this time. Mr. Hugh P. Baker, of New York City, was elected a member of the alumni committee, in the place of Dr. David Starr Jordan, whose term of office expires this year. Announcement was made of the formation of a Conference of Honorary Societies during the Phi Beta Kappa Sesqui-Centennial at Williamsburg, and the question of the possible participation of Sigma Xi in such an organization was referred to the executive committee. The Annual Sigma Xi Dinner was held at the Hotel Normandie, with an attendance of 200. The Fifth Annual Joint Meeting of the American Association for the Advancement of Science and Sigma Xi was held Tuesday evening in Drexel Institute, the speaker for this occasion being Mr. Herbert Hoover, secretary of commerce, who chose for his topic, "The Nation and Science." This was the fifth annual Sigma Xi lecture.

The American Association of University Professors met on Friday, December 21, and Saturday, January 1, with an attendance of 150 delegates and members, representing eighty-two institutions. The principal subjects discussed were the reports on "Freedom of Teaching in Science," "Intercollegiate Athletics," "The Selection, Retention and Promotion of Undergraduates," "Cooperation with Latin-American Universities to promote Exchange Professors and Fellowships," and "Sectioning on the Basis of Ability and Encouragement of University Research." Particular interest attached to the report of the Committee on Freedom of Teaching in Science, in view of information presented by delegates from Texas, Georgia, Tennessee and North Dakota, and it was voted: *That this association take the initiative in bringing about a more effective cooperation between all groups of organizations interested in opposing legislative restrictions on freedom of teaching in state-supported institutions and in defending the principle of the separation of church and state in educational matters.* —At the annual dinner of the Association of University Professors, addresses were made by President Aydelotte, of Swarthmore College, who spoke on the waste from the neglect of our best students, and by Dean Hawkes, of Columbia University, on a recent report by President Hopkins, of Wabash College, on "Personnel Methods of the American Council on Education." The president, W. T. Semple, the secretary, H. W. Tyler, and the treasurer, Joseph Mayer, all hold over; for vice-president, J. S. P. Tatlock, of Harvard University, was elected, in succession to W. B. Munro.

The Gamma Alpha Graduate Scientific Fraternity held a council meeting on Tuesday afternoon, with President F. H. Krecker presiding and C. W. Dodge as secretary. Reports by councillors from Cornell, Johns Hopkins, Dartmouth, Illinois, Wisconsin, Michigan, Yale, Minnesota, Iowa, Ohio and Harvard

show a healthy growth and development during the past year. Exchange lectureships between chapters have been very successful where they have been tried. Thirty-four representatives attended the convention and banquet the same evening, at which time Professor Paul S. Welch, of the University of Michigan, gave a very excellent discussion of the work and needs of European biological stations and compared them with similar stations in America. The officers for the year are as follows: *President,* Richard Hartshorne; *vice-president and secretary,* Sidney M. Caldwell; *treasurer,* C. E. Mickel; *editor,* L. H. Tiffany. The 1927 meeting will be held in Nashville contemporaneously with the meetings of the American Association for the Advancement of Science.

The Sigma Delta Epsilon Graduate Women's Scientific Fraternity held its fifth annual convention following a breakfast on Wednesday morning. An open breakfast meeting was arranged for Thursday morning. About fifty members were present, representing each of the seven chapters. The national officers elected for 1927 are: *President,* Julia T. Colpitts; *first vice-president,* Emma L. Fisk; *second vice-president,* Esther Griffith; *secretary,* Amy G. McKeel, Cornell University, Ithaca, New York; *treasurer,* Emma Fleer.—On Wednesday Dr. Christiana Smith spoke of the work of the Association to Aid Scientific Research Work by Women, to which Sigma Delta Epsilon is a contributor. This association offers $2,000 to be awarded in April, 1928, to a woman who has carried on research work of distinction. For the breakfast on Thursday morning, invitations were extended to all women interested in science and over one hundred were present. The president gave a brief history of Sigma Delta Epsilon, which exists to unite women in friendship through science. Dr. Florence R. Sabin, honorary member of Sigma Delta Epsilon, then gave an inspiring talk on "The Blood Cells in Tuberculosis."

The Pi Mu Epsilon Mathematical Fraternity held its annual convention Monday afternoon, with an unusually large and enthusiastic attendance of delegates. The University of Pennsylvania chapter entertained all attending members from other chapters at a dinner Monday evening, at which Professor H. S. Everett, of Bucknell University, presided.

THE ORGANIZATION AND WORK OF THE AMERICAN ASSOCIATION

The American Association for the Advancement of Science aims to advance science in the New World in every feasible way. Booklets on the nature and work of the association and full information on all topics concerning it may be secured at any time from the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C. All who are in any way interested in the advancement of knowledge are invited to become members if they are not already enrolled.

OFFICERS OF THE ASSOCIATION FOR 1927

PRESIDENT

Arthur A. Noyes, California Institute of Technology, Pasadena, Calif.

RETIRING PRESIDENT

L. H. Bailey, 103 Sage Place, Ithaca, N. Y.

VICE-PRESIDENTS, RETIRING VICE-PRESIDENTS AND SECRETARIES OF THE SECTIONS

Section A (Mathematics):

Vice-President, Dunham Jackson, University of Minnesota, Minneapolis, Minn.

Retiring Vice-President, Edward V. Huntington, Harvard University, Cambridge, Mass.

Secretary, R. C. Archibald, Brown University, Providence, R. I.

Section B (Physics):

Vice-President, A. H. Compton, University of Chicago, Chicago, Ill.

Retiring Vice-President, William Duane, Bio-Physical Laboratories, Harvard University, 695 Huntington Ave., Boston, Mass.

Secretary, A. L. Hughes, Washington University, St. Louis, Mo.

Section C (Chemistry):

Vice-President, Roger Adams, University of Illinois, Urbana, Ill.

Retiring Vice-President, Lauder W. Jones, Princeton University, Princeton, N. J.

Secretary, Gerhard Dietrichson, Massachusetts Institute of Technology, Cambridge, Mass.

Section D (Astronomy):

Vice-President, Walter S. Adams, Mt. Wilson Observatory, Pasadena, Calif.

Retiring Vice-President, Robert G. Aitken, Lick Observatory, Mt. Hamilton, Calif.

Secretary, Philip Fox, Dearborn Observatory, Northwestern University, Evanston, Ill.

Section E (Geology and Geography):

Vice-President, Charles Schuchert, Yale University, New Haven, Conn.

Retiring Vice-President, G. H. Ashley, State Capitol, Harrisburg, Pa.

Secretary, G. R. Mansfield, U. S. Geological Survey, Washington, D. C.

Section F (Zoological Sciences):

Vice-President, C. E. McClung, University of Pennsylvania, Philadelphia, Pa.

Retiring Vice-President, Winterton C. Curtis, University of Missouri, Columbia, Mo.

Secretary, Geo. T. Hargitt, Syracuse University, Syracuse, N. Y.

Section G (Botanical Sciences):

Vice-President, William Crocker, Boyce Thompson Institute for Plant Research, Yonkers, N. Y.

Retiring Vice-President, Benjamin M. Duggar, Missouri Botanical Garden, St. Louis, Mo.

Secretary, Sam F. Trelease, Columbia University, New York, N. Y.

Section H (Anthropology):

Vice-President, R. J. Terry, Washington University, St. Louis, Mo.

Retiring Vice-President, R. Bennett Bean, University of Virginia, University, Va.

Secretary, Fay Cooper Cole, University of Chicago, Chicago, Ill.

Section I (Psychology):

Vice-President, Knight Dunlap, Johns Hopkins University, Baltimore, Md.

Retiring Vice-President, Margaret Floy Washburn, Vassar College, Poughkeepsie, N. Y.

Secretary, Frank N. Freeman, University of Chicago, Chicago, Ill.

Section K (Social and Economic Sciences):

Vice-President, W. S. Leathers, Vanderbilt University, Nashville, Tenn.

Retiring Vice-President, Joseph H. Willits, University of Pennsylvania, Philadelphia, Pa.

Secretary, F. L. Hoffman, Babson Institute, Babson Park, Mass. (Dr. Hoffman has resigned and no successor has been elected.)

Section L (Historical and Philological Sciences):

Vice-President, Harry Elmer Barnes, Smith College, Northampton, Mass.

Retiring Vice-President, W. Carl Rufus, University of Michigan, Ann Arbor, Mich.

Secretary, Frederick E. Brasch, Library of Congress, Washington, D. C.

Section M (Engineering):

Vice-President, A. N. Talbot, University of Illinois, Urbana, Ill.

Retiring Vice-President, C. R. Richards, Lehigh University, Bethlehem, Pa.

Secretary, N. H. Heck, U. S. Coast and Geodetic Survey, Washington, D. C.

Section N (Medical Sciences):

Vice-President, G. Canby Robinson, Vanderbilt University, Nashville, Tenn.

Retiring Vice-President, Rufus I. Cole, Rockefeller Hospital, New York, N. Y.

Secretary, A. J. Goldforb, College of the City of New York, New York, N. Y.

Section O (Agriculture):

Vice-President, L. E. Call, Kansas State Agricultural College, Manhattan, Kans.

Retiring Vice-President, C. F. Marbut, U. S. Bureau of Soils, Washington, D. C.

Secretary, P. E. Brown, Iowa State College, Ames, Iowa.

Section Q (Education):

Vice-President, Arthur I. Gates, Teachers College, Columbia University, New York, N. Y.

Retiring Vice-President, Melvin E. Haggerty, University of Minnesota, Minneapolis, Minn.

Secretary, A. S. Barr, University of Wisconsin, Madison, Wis.

PERMANENT SECRETARY

Burton E. Livingston, Johns Hopkins University, Baltimore, Md. (Association mail address: Smithsonian Institution Building, Washington, D. C.)

GENERAL SECRETARY

W. J. Humphreys, U. S. Weather Bureau, Washington, D. C.

TREASURER

John L. Wirt, Carnegie Institution of Washington, Washington, D. C.

SECRETARY OF THE COUNCIL AND PROGRAM EDITOR

Sam F. Trelease, Columbia University, New York, N. Y.

EXECUTIVE ASSISTANT

Sam Woodley, Smithsonian Institution Building, Washington, D. C.

AUDITOR

R. B. Sosman, Geophysical Laboratory, Carnegie Institution of Washington, Washington, D. C.

NEWS MANAGER

Austin H. Clark, U. S. National Museum, Washington, D. C.

MANAGER OF EXHIBITION

H. S. Kimberly, Smithsonian Institution Building, Washington, D. C.

MEMBERS OF THE EXECUTIVE COMMITTEE OF THE COUNCIL[4]

J. McKeen Cattell (1930), *chairman*, Garrison-on-Hudson, N. Y.

A. A. Noyes, president of the association (1927), California Institute of Technology, Pasadena, Calif.

Burton E. Livingston, permanent secretary (1928), Smithsonian Institution Building, Washington, D. C.

W. J. Humphreys, general secretary (1928), U. S. Weather Bureau, Washington, D. C.

Herman L. Fairchild (1927), University of Rochester, Rochester, N. Y.

Vernon Kellogg (1928), National Research Council, Washington, D. C.

F. R. Moulton (1929), University of Chicago, Chicago, Ill.

W. A. Noyes (1927), University of Illinois, Urbana, Ill.

M. I. Pupin (1929), Columbia University, New York, N. Y.

Henry B. Ward (1930), University of Illinois, Urbana, Ill.

Edwin B. Wilson (1928), Harvard School of Public Health, Boston Mass.

MEMBERS OF THE COMMITTEE ON GRANTS FOR RESEARCH[4]

Aleš Hrdlička (1927) (for Psychology, Anthropology, Education, Economics), *chairman*, U. S. National Museum, Washington, D. C.

B. M. Davis (1927) (for Botany), University of Michigan, Ann Arbor, Mich.

[4] The number in parentheses denotes the year at the end of which the member's term of office is to expire.

Nevin M. Fenneman (1928) (for Geology), University of Cincinnati, Cincinnati, Ohio.

Joseph Erlanger (1928) (for Physiology), Washington University School of Medicine, St. Louis, Mo.

L. G. Hoxton (1929) (for Physics), University of Virginia, University, Va.

Vernon Kellogg (1929) (for Zoology), National Research Council, Washington, D. C.

W. Lash Miller (1930) (for Chemistry), 8 Hawthorne Ave, Toronto, Ont., Canada.

Oswald Veblen (1930) (for Mathematics), Princeton University, Princeton, N. J.

(The permanent secretary acts as secretary of the Committee on Grants.)

GENERAL OFFICERS OF THE COMMITTEE OF ONE HUNDRED ON SCIENTIFIC RESEARCH

Chairman, A. A. Noyes, president of the Association, California Institute of Technology, Pasadena, Calif.

Secretary, Rodney H. True, University of Pennsylvania, Philadelphia, Pa.

Other Officers

Lists of the members of the section committees and of other committees may be secured from the permanent secretary's office at any time, as well as other information regarding the organization of the association.

FUTURE ANNUAL MEETINGS

The American Association meets annually in convocation week, the dates for the meetings being determined by a rule adopted by the council. When New Year's day falls on Thursday, Friday or Saturday the meeting period is the week (Monday to Saturday, inclusive) in which New Year's day occurs. When New Year's day falls on Sunday the meeting period is the preceding week. And when New Year's day falls on Monday, Tuesday or Wednesday the meeting opens on December 27 and continues through January 2. Plans of individuals and societies may thus be made years in advance. It requires just twenty-eight years to complete the cycle of dates and days. Dates and meeting places for the next six annual meetings are shown below.

1927–28 (Nashville): Monday, December 26 to Saturday, December 31, 1927.

1928–29 (New York): Thursday, December 28, 1928, to Wednesday, January 2, 1929.

1929–30 (probably Des Moines): Friday, December 27, 1929, to Thursday, January 2, 1930.

1930–31 (probably Cleveland): Monday, December 29, 1930, to Saturday, January 3, 1931.

1931–32 (probably New Orleans): Monday, December 28, 1931, to Saturday, January 2, 1932.

1932–33 (Chicago): Monday, December 26, to Saturday, December 31, 1932.

SPECIAL NOTES AND NOTICES

(1) This issue of SCIENCE is sent to all members whose dues have been paid for 1926, whether they have regularly received this journal or *The Scientific Monthly*. For those who have not yet paid their dues for 1927, this is the last issue to be sent until payment shall have been made. Annual dues for the current year were due last October 1. The journal has been continued through January to the few who are still in arrears, with the hope that they might find it convenient to pay before the end of the month and with the thought that they would appreciate receiving these reports of the fifth Philadelphia meeting.

(2) The next meeting of the association will be at Nashville, Tenn., from Monday, December 26, to Saturday, December 31, 1927. That will be an especially interesting meeting in many ways. The attendance will probably be relatively small, with relatively few meetings of the associated societies and a consequent degree of freedom from complexity not possible in the case of the larger meetings. Announcements about the Nashville meeting will appear in SCIENCE from time to time, especially in the issue of December 2.

(3) The association needs more members and better support. Members are asked to secure new annual, life and sustaining members, and also donors, who may be willing to make contributions to the general endowment or for special purposes. Annual members are asked to become life members as soon as possible. All members of associated organizations are asked to join the association if they are not already enrolled. Any member of any affiliated organization is now allowed to become a member of the association without paying the usual entrance fee of five dollars. Write to the permanent secretary for more information.

(4) Members of the association each receive with membership a subscription to either SCIENCE or *The Scientific Monthly*. Sample copies may be had on request, from the permanent secretary's office.

(5) Members who take SCIENCE may receive *The Scientific Monthly* by making an additional payment of three dollars a year. Those who take the *Scientific Monthly* may receive SCIENCE by making a like additional payment. In other words, a member may have annual membership and both journals by paying eight dollars per year. This is according to a new arrangement adopted at the fifth Philadelphia meeting.

(6) Any member may receive the *Science News Letter* at the special reduced price of three dollars a year.

(7) The total enrollment of the association was 14,635 on January 10. On that date there were 10,790 paid-up annual members, 3 living sustaining members, 407 living life members and 23 living emeritus members. Altogether, there were 11,223 members in good standing. One hundred and thirty-five new members joined at the Philadelphia meeting.